THE CHEMIST AND DRUGGIST

To Correspondents.—Communications for the Editor should be addressed "To the Editor of the Chemist and Druggist," Colonial Buildings, 44a, Cannon Street, and if intended for insertion, should be written *on one side of the paper only*, and authenticated by the real name and address of the writers, not necessarily for publication, but as a guarantee of good faith.

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All Advertisements intended for insertion in the current Month must be sent to THE PUBLISHER on or before the 12th, except Employers' and Assistants' Advertisements, which can be received up to 10 a.m. on the morning previous to publication.

Our Country and Colonial Subscribers are requested to furnish the Editor with any trade gossip that they may consider interesting.

Subscribers are requested to observe that, for the future, the receipt of The Chemist and Druggist in a *Green Wrapper* indicates that with that number the term of subscription has expired, and that no further numbers will be sent until the same has been renewed. We issue this notice very respectfully, not that we distrust our Subscribers, but simply because we find it impossible to keep an immense subscription list like that we now have, extending to almost every town in the world, in order without an exact system like this.

Editorial Notes.

In another portion of our journal will be found a brief report of the proceedings of the chemists and druggists of Newcastle and Gateshead, in connection with the course they propose to take to meet the necessity of increased facilities for pharmaceutical education under the regulations of the new Pharmacy Act. We will not refer to the matter now, further than to say, that we regard the arrangements in progress amongst our friends in the North as eminently right. It is no small thing, and it is certainly an indication of a prospectively altered *status*, that a body like the Medical Faculty of the University of Durham should have recommended to their Senate the appointment of a Lecturer on Practical Pharmacy on the same standing with the purely medical lectureships, and that an independent, properly defined curriculum for "Students in Pharmacy" should have been established, not on the narrow basis of enabling students to scrape through the "pass" examinations, but on one which should qualify them to take positions as thoroughly qualified pharmacists. The temporary concessions, too, in the matter of fees, show the desire of the Council of the College not to allow the undertaking to be marred by small obstacles at the outset; indeed, it seems to us that the complete success of the scheme depends now entirely on the earnestness of those for whose advantage the arrangements have been made. Not the least encouraging reflection is the manifest desire for a right understanding between the practitioners of medicine and those of pharmacy. We may, ere long, put together the thoughts called up by a review of the whole subject, and present them for the consideration of our readers. Meanwhile, we wish our Newcastle and Gateshead friends God speed!

The transmutation of Brass into Gold has undoubtedly been effected by the proprietors of the Golden Hair Fluids, which Mr. Henry Matthews has analysed for us. When a guinea can be obtained for a few minims of Acidum Nitro-hydrochloricum dil., we must admit that some of the bye-ways of pharmacy are paved with gold. We may be blamed for publishing trade secrets, but we are quite sure that most of our supporters will commend us for exposing the true character of these harmful hair washes.

The second reading of the Bill to amend the Pharmacy Act of 1868 is fixed for this evening (the 15th). The Bill, in its present form, contains but one clause, as follows:—"Nothing contained in the first fifteen sections of the recited Act shall extend to, or interfere with the business of any legally-qualified medical practitioner in Scotland duly registered under the Medical Act, or of any legally-qualified veterinary surgeon in Scotland."

Referring to the grievance of assistants who cannot aver that they have been engaged in dispensing for three months *immediately* prior to the passing of the Act, the *Lancet* states authoritatively that the effect of the word "immediately" will be negatived by the Government. Upon the subject of the troublesome poison label, our contemporary writes:—"Much difficulty has arisen as to the application of the statutory word 'poison' to preparations containing poisonous ingredients in comparatively minute quantity. Too common usage of the term 'poison' would necessarily detract from the significance of the latter as a safeguard against error and accident. We have the best reason for stating that this difficulty is to be removed, as it is the opinion of the Privy Council that, to bring a preparation of a poison into the same category as the poison itself, it must be, like the latter, 'deadly and dangerous.'"

We learn that the Sandford Testimonial Fund will be closed on the 7th of April, and we trust that those who intend to contribute to this graceful acknowledgment of Mr. Sandford's great services in promoting Pharmaceutical Legislation will not delay the forwarding of their subscriptions.

We called the attention of our readers to the important communication from the proprietor of the Benzine Collas, respecting the Petroleum Act.

The following advertisement, from the *Bristol Daily Press*, speaks for itself—or rather for the only man thoroughly alive to the advantages of the lowest form of advertising:—

PATENT MEDICINE DEPOT.—HENRY HODDER is the only Man thoroughly alive to the wants of his Friends and Neighbours. He gave them last week, on the article Patent Medicines alone, £7; 510 Articles sold. This week the sale and liberality on the increase; 1s. 1½d. 2s. 9d., and 4s. 6d. articles for 10d., 2s. 4½d., and 3s. 9d.—11, BROAD STREET.

In the current number of the *Pharmaceutical Journal*, Mr. George Manby, of Southampton, gives the following timely caution to the trade:—"As so much has been and is now being done to somewhat improve the state of pharmacy, I think that it would be well to inform certain members that they are not adding to its respectability by furnishing *patent medicines*, such as Steedman's powders, Fenning's powders, Cockle's pills, etc., to small shopkeepers, or rather *hucksters*, for them to supply to their customers *in single doses*. Two or three instances have been brought to my knowledge, and on inquiry I find it is done in this town to some extent (of course curtailing considerably the

legitimate business of the chemist). I have ascertained at the Inland Revenue Office that this practice is strictly illegal; the Patent Medicine Act clearly states that 'no person can retail these medicines unless they pay the licence.'"

In October last we printed a Report from the United Society, furnished to us by the Secretary, giving the names of President, Vice-Presidents, and Executive Committee. Mr. Henry Turner, of Fleet-street, wishes us to state that he never gave his consent for his name to appear as a member of that Executive Committee.

Our Analytical Reports.

GOLDEN HAIR FLUIDS.

BY HENRY MATTHEWS, F.C.S.

From the time when the old Roman Empire was at its highest point of luxury and magnificence down to the present period, there seems to have been at intervals, on the part of the fair sex at least, a desire for golden locks, manifested in more modern times by the use of gold powder on the hair, as introduced by the Empress of the French in 1860, or more lately by the use of dyes or washes applied for the purpose of actually changing the colour of the hair itself. The latter practice has, by one of the ever-changing caprices of fashion, almost passed away; and, in consequence, only a very small number of preparations for the production of golden hair are now advertised for sale. Four of these have been examined, and the results show that, like their cogeners the Hair Restorers, the "Golden Fluids" have amongst themselves the same general characters.

1. AURICOMUS OR GOLDEN FLUID.

This, to quote from its label and bills, "though harmless as pure water, has the astonishing power of quickly imparting a rich golden flaxen shade to hair of any colour. Unlike other preparations, it has neither spirit nor alkali in its composition," etc.

The auricomus is a clear, colourless fluid, smelling slightly of nitric acid, this odour being almost overcome by the perfume which the mixture contains. It certainly does not contain any alkali, inasmuch as its reaction is strongly acid; and it consists entirely of *dilute nitro-hydrochloric acid*, the non-volatile constituents not amounting to one grain in a bottle containing 2·25 fluid ounces, which, upon analysis, furnished 0·955 grains of actual hydrochloric acid (HCl); corresponding to 23·3 minims of the acidum nitro-hydrochloricum dilutum of the *British Pharmacopœia*. or 10·35 nims of dilute acid in one fluid ounce of mixture.

2. ROBARE'S AUREOLINE.

According to the label this is "free from all objectionable qualities," etc. The name of this preparation appears to have been borrowed from that of the well-known golden yellow pigment introduced and manufactured by a celebrated firm of artists' colour manufacturers in Rathbone-place.

The Aureoline, like the Auricomus, is a colourless fluid having a strongly acid reaction and an odour of nitric acid, which the amount of perfume used does not conceal, and it also consists of dilute nitro-hydrochloric acid; a bottle containing 3·75 fluid ounces furnishing 1·74 grains of actual hydrochloric acid, an amount equivalent to 42·4 minims of dilute nitro-hydrochloric acid of the *Pharmacopœia*, or 11·3 minims of the dilute acid in one fluid ounce of Aureoline.

3. NICOLL'S GOLDEN TINCTURE.

The label of this article has the merit of not making any professions as to the perfect harmlessness of its ingredients, simply stating that it is "for giving a brilliant golden shade to hair of any colour."

This preparation, like the preceding, is a colourless fluid, but containing a very slight deposit, smelling of nitric acid, and having a strongly acid reaction, consisting of dilute nitro-hydrochloric acid, together with a trace of sulphuric acid, the amount of non-volatile constituents being inconsiderable.

A bottle containing 2 fluid ounces gave 0·5 grains of actual hydrochloric acid, corresponding to 12·1 minims of the dilute nitro-hydrochloric acid of the *Pharmacopœia*, or equal to 6 minims of the dilute acid to one fluid ounce of the compound.

4. ROSS'S SOL AURINE.

On the wrapper of this we are told that "The production of a preparation which shall imitate nature in its loveliest aspect with regard to that tint of hair so fashionable in ancient classic ages," etc.,—"and which shall at the same time be harmless, has been a desideratum,"—and the reader or purchaser is left to infer that the said "desideratum" has been attained in the "Sol Aurine."

The Sol Aurine, which has a strongly acid reaction and smells most distinctly of nitric acid, is a clear, colourless fluid, containing a considerable amount of a transparent gelatinous deposit. Like the other preparations examined, it consists principally of dilute nitro-hydrochloric acid, the transparent deposit consisting of precipitated silica. A bottle holding 2·5 fluid ounces furnished 2·77 grains of anhydrous hydrochloric acid, corresponding to 67·2 minims of the acidum nitro-hydrochloricum dilutum, *B.P.*, or equal to 26·8 minims of *Pharmacopœia* acid per fluid ounce of Sol Aurine. Other than the deposit of silicious hydrate before mentioned, the non-volatile constituents were inappreciable in amount, and were, as in the other fluids examined, such as would be evidently due to the use of either common water or impure acids in the preparation of the washes.

There is little doubt that all of the above preparations would effect the purpose for which they were intended, the principal agent in all of them being the nitric acid, the effect of which is possibly aided by the bleaching power of the very small portion of nascent chlorine derived from the decomposition of the hydrochloric acid by the nitric acid.

With regard to their use being safe or otherwise I am not prepared to speak positively, but I have been informed by a medical friend, Mr. Charles Matthews, of Southampton-street, Strand, that he has, in the course of his practice, been called upon to attend ladies who, by the incautious use of golden hair fluids, had produced burns from portions of the fluid falling upon their necks and shoulders.

I am, however, bound to say that I was unable, with any of the preparations mentioned above, to produce even a slight stain upon the skin; but, as of course, I could only experiment upon myself, I cannot say what might be the effect on the whiter and more delicate surface of the necks and shoulders of the fairer sex.

In conclusion, I would observe that, as far as the preparations examined are concerned, it is satisfactory to find that they contain no compounds of antimony or arsenic.

At a meeting of the curators of the University of Edinburgh, held on Wednesday, a letter was read from Professor Lyon Playfair, M.P., intimating his intention to resign the Chair of Chemistry at the close of the present session. There are already a number of candidates for the professorship.

Veterinary Notes.

BY W. HUNTING, M.R.C.V.S.

HOOF OINTMENTS.

WITH few exceptions, horses require some preparation to keep their feet in perfect order, the exceptions being those animals whose feet are never rasped save on the ground surface, and that pass their time on dry ground. The feet most requiring it are those with which most trouble is taken in shoeing, which are rasped all over, so as to look even and smooth. The outer layer of horn on a horse's foot is much harder than the deeper layers. It becomes hard from evaporation and from being the oldest layer, that farthest from the secreting surface. The hardness is for a double purpose; for protection, and to keep pliable and tough the deeper layers. If we remove it the deeper layers become dry and consequently brittle, thus predisposing the foot to "sandcracks," &c. To make matters worse, the foot, thus unnaturally hardened, is kept wet with porous felts or damp clay. It is true the application of water softens the foot for a time, but when removed the horn soon hardens again, becoming harder than ever, and, worst of all, brittle. The notion that a naturally dry, hard foot is liable to injure the sensitive structures beneath is erroneous; for the hardness is only on the surface, and that very hardness preserves the substance of the foot in its natural condition.

A hard foot is only objectionable when brittle, and watery applications, by opening the minute structures, produce this brittleness when the foot once dries again. In further proof of the injurious effects of too much moisture on the feet, I would draw attention to horses in damp countries, say Holland, or even the fens of Lincolnshire, the horses of which are proverbial for bad feet.

Ointments have not the same objectionable action as water. They act, not by being absorbed into the horn, but by checking any undue escape of the natural moisture of the tissue, and thus, without breaking up structure, preserve a strength and toughness absolutely necessary to good feet.

Hoof ointments, for convenience, must have a certain consistency, so as not to spill like oil, if accidentally upset, and yet not to be so hard as to require warming for use. They must not be "sticky," as then the brush with which they are applied gets clogged, and straws and dirt stick to the foot; for this reason, wax should not be added to any hoof ointment. They must be of a dark colour, and for this purpose tar is a useful ingredient, besides its beneficial action upon any "thrushes" which may exist. Lastly, they must wash off, so as not to interfere with the ready cleaning of the horse, when necessary. This last quality is not absolutely essential to a good protecting hoof ointment, but its advantage must not be overlooked by those who wish to sell an eligible article. Perhaps, in giving formulæ, it would be better to divide them into two varieties—

Those which are used for bad feet as a protecting agent, and contain no saponifying ingredient: and

Those which are used regularly as preventives, and like hair dyes and pomatum, "beautifying agents."

The following are good of the first class:—

1.—Barbadoes Tar ... ...
Burgundy Pitch ... } equal parts.
Russian Tallow ... ...

2.—Stockholm Tar ... ... 2lb.
Russian Tallow... ... 1lb.
Venice Turpentine ... ½lb.

In mixing these, melt the two last ingredients together first, then add and thoroughly mix the tar.

The following preparations are about the best I know of as samples of the second class:—

1.—Stockholm Tar ... ... 3lb.
Soft Soap ... ... 4lb.
Fish Oil ... ... ½ pint.

2.—Stockholm Tar ... ... 4lb.
Soft Soap ... ... 4lb.
Tallow ... ... 2lb.
Fish Oil ... ... 1 pint.

I prefer the latter as being of the better consistence.

I am quite aware that strong alkalis injure horn, but in these forms the excess of fats prevents any marked effects.

Glycerine with fats would obviate all objections, but I know as yet of no mixture with the proper consistence and colour that would wash off pretty easily. Soft soap by itself is not a good application, as it tends to make the hoof brittle.

OPEN JOINTS.

One of the most troublesome surgical cases we meet with in the lower animals is "open joint." The difficulty is to check the flow of joint-oil or synovia. To do this we must fix the joint, so as to prevent movement. Some joints, as the fetlock, &c., are easily fixed by a bandage; larger joints, as the knee and hock, usually need some contrivance, as an iron bar or piece of wood, put on to the leg like a splint. The higher joints we are not able to fix in this manner, but if the lower ones be fixed, motion is always more or less limited in the one immediately above.

In the case of the stifle-joint, from the anatomical arrangement of certain tendons, movement cannot take place if the hock be fixed. The jaw-joint is a very awkward one to fix, as by so doing we stop mastication; nevertheless, it must be done for a time, and motion must *be limited* till recovery ensues. A tight nose-band effectually does this. By some, blisters are applied round the opening and over the joint; they act very well; they increase the granulating process, and keep the joint still.

In all such cases, however, we gain if we can coagulate the discharge. The discharge is albuminous, so there are a number of substances we may use. A common one is alum; not by itself, but as an ingredient of what is called OPEN-JOINT POWDER, made thus—

Alum ... ...
Ferri Sulph. ... ... } equal parts.
Gum Myrrh ... ...

Finely powder, and sprinkle on to the part.

The objection to this is, that albumen is re-dissolved by alum in excess. The two best and neatest applications are, nitrate of silver in the solid form, or corrosive sublimate in solution, applied with a feather. Care must be taken with both of these substances not to introduce them into the joint, but merely to touch the escaping synovia at the opening. Finally, never remove the plug of coagulated synovia from the opening when dressing a case.

I ought to have said I dissolve one drachm of corrosive sublimate in an ounce of spirits of wine.

Abstracts of Foreign Papers.

EXTRACT OF VALERIANATE OF AMMONIA.

SOME years ago, M. GUYOT DANNECY published a process for the preparation of extract of valerian, which consisted in lixiviating the root in a displacement apparatus with solution of carbonate of ammonia of a certain density and reducing the liquid by careful evaporation. This preparation represented all the active principles of the root used, and gave very great satisfaction. M. G. Dannecy has since recognised the fact that many patients have

evinced great repugnance to the medicine in the form of extract, and this has led him to seek a method of reducing its bulk, so as to admit of its being administered in the form of gelatinous capsules. He ultimately adopted the following process:—

Valerian root in coarse powder . .	100
Alcohol (60 per cent.)	80
Liquor ammoniæ (22 per cent.) . .	20

Treat the valerian root in a displacement apparatus, with the mixture of alcohol and ammonia. When this shall have percolated, introduce a quantity of alcohol (60 per cent.) sufficient to bring the weight of the ammoniacal tincture to the same figure as that of the valerian employed; evaporate, with continual agitation, at a temperature not exceeding 160° F., to a syrupy consistence. This extract is enclosed in gelatinous capsules, each of which contains about seven or eight grains.

By making the extract with alcohol, in the manner above detailed, a large amount of inert matter is excluded; and thus it is possible to obtain the active principle itself,—viz., the valerianate of ammonia in as small a bulk as possible.

ON THE PREPARATION OF CAPSULES OF PHOSPHORISED OIL.

M. Schmitt gives the following outline of the method employed for the preparation of capsules of phosphorised oil:—Having ascertained the average quantity of oil which each capsule will hold, by weighing five or six together, a sufficient quantity of sweet oil of almonds is taken to fill 100. Supposing each capsule will hold six grains, 600 grains of oil are introduced into a dry flask of as small a size as possible. A fragment of phosphorus, weighing one and a half grains, apidly dried on blotting-paper, is then dropped into the oil. The flask is corked, and introduced into a water-bath, which is heated gradually to a temperature of 180° F., with the adoption of the necessary precautions. In from twenty-five to thirty minutes, the phosphorus will have become completely dissolved, when the flask may be left to cool in the bath itself, without removing the cork. When cold, the oil may be divided between the hundred capsules. Phosphorised oil, prepared in this manner, keeps very well; M. Schmitt has preserved such capsules for more than a year. Another advantage is, that the physician can regulate the dose in the easiest manner, since he has only to prescribe the number of capsules to be taken daily.

PRODUCTION OF SULPHATE OF MAGNESIUM.

In the mines at Stassfurth is found a mineral consisting of a mixture of sulphate of magnesium, chloride of magnesium, and chloride of potassium. The separation of the sulphate of magnesium is based on its relatively slight solubility, especially in water containing salt in solution. The sulphate of magnesium thus obtained as a residue contains no more than 3 per cent. of common salt, and it may be readily purified by crystallisation. The factories at Stassfurth and Anhalt turn out annually 6,000 tons.

Pharmaceutical Society of Great Britain.

EVENING MEETING.

*Wednesday, March 3.**

Mr. Henry Sugden Evans, Vice-President, in the chair.

THE minutes of the preceding meeting having been read and declared correct, and subsequent donations to the library acknowledged,

Professor Bentley made some remarks on specimens of American herbs and cinchona barks that were on the table, and

Mr. D. Hanbury drew attention, in a few words, to a specimen of black wax from India.

SULPHUROUS ACID.

Mr. C. H. Wood then referred to Mr. Umney's paper on Sulphurous Acid, read at the last meeting of the society. Mr. Umney, in reference to the Pharmacopœial requisition of a specific gravity of 1·04 for sulphurous acid solution, had denied that this specific gravity indicated the percentage of sulphurous acid, also fixed by the Pharmacopœia, namely, 9.2, considering that the statements involved a discrepancy. Mr. Wood showed by calculation that there was no such discrepancy, and imagined that Mr. Umney's mistake arose from his considering a drachm as 60 grains instead of 54·7; a correction should also be made for specific gravity. Mr. Wood acknowledged the value of Mr. Umney's experiments, but differed on one or two points. Mr. Umney had stated that it was not easily possible to make a solution of sulphurous acid, having a specific gravity of 1·04; whereas Mr. Wood had succeeded in making such a solution with a specific gravity of 1·048, although he acknowledged that there was a great loss of gas towards the end of the process, but by passing it long enough, and by surrounding the receivers with cold water, Mr. Wood had found no difficulty in obtaining the acid of the Pharmacopœia. This, however, had not been done with the proportions of acid and charcoal compared with the water to be saturated, as ordered by the Pharmacopœia, a larger proportion having been used. Mr. Wood recommended the use of an ordinary iron quicksilver bottle, in the preparation of small quantities of sulphurous acid, and mentioned that the action of strong oil of vitriol on iron was different to that of dilute acid, sulphurous acid being produced in the first instance, hydrogen in the second. Mr. Wood considered that the Pharmacopœia test for determining the strength of sulphurous acid quite good enough for practical purposes, although perhaps not sufficiently accurate for Mr. Umney's purposes. He referred to Bunsen's investigations on the iodine process, which showed that accuracy could not be obtained with a solution containing more than 0·04 per cent. of acid, and recommended dilution to the proper extent, with well-boiled distilled water. Mr. Wood not only agreed with Mr. Umney, that acid of the Pharmacopœia strength could not be kept, but was also of opinion that a 5 per cent. acid, as recommended by Mr. Umney, would not keep.

Professor Attfield confirmed Mr. Wood's remarks on the tests for the strength of sulphurous acid solutions. The directions in the Pharmacopœia were that 34·7 grains should be diluted with one ounce of water; the strength would then be equal to 0·8 per cent. To comply with Bunsen's directions, this would require to be further diluted with 19 ounces of water, making a total of 20; therefore Professor Attfield had always considered "ounce" in the Pharmacopœia directions for the test to be perhaps a misprint for "pint;" at all events, if a pint instead of an ounce of water were used, the official directions would accord with those of Bunsen.

Professor Redwood would not allow that "ounce" was a misprint for "pint," or that any error was involved of the slightest importance. The method given was approximative in its results, and that alone was necessary. As he had previously stated to Mr. Umney, Professor Redwood did not consider the Pharmacopœia acid suitable for the purposes to which it was to be applied, or that one of such strength was so easily made or kept as a more dilute acid. So long, however, as a process remained in the Pharmacopœia, it must be adhered to, although amendment might be suggested.

* Reported specially for this journal.

Certainly in a new Pharmacopœia a 5 per cent. acid might be advantageously introduced.

Mr. UMNEY stated that his experiments were made on acid prepared according to the British Pharmacopœia, and that therefore Mr. Wood should not compare them with his own irregular experiments. He repeated his statement, that solution of such strength could not be easily made, but acknowledged his mistake as to the discrepancy between the specific gravity and percentage strength.

Mr. W. A. TILDEN then read a paper

ON DILUTED NITRO-HYDROCHLORIC ACID.

In the British Pharmacopœia of 1867 the process for the preparation of dilute nitro-hydrochloric acid is as follows:—Nitric acid (S. G. 1·42), and hydrochloric acid (S. G. 1·16) are mixed together in the proportion of three fluid ounces of the former to four fluid ounces of the latter, and after the lapse of twenty-four hours twenty-five fluid ounces of water are added. The intention obviously acted upon in giving these directions is to permit the chemical reaction entered into by the acids to proceed as far as possible towards completion. That the mutual reaction of the undiluted acids gives rise to permanently gaseous products, and consequently, if the experiment be conducted in the usual way, to loss of material, is obvious, from the coloured atmosphere of the bottle, and from the acid dew which films the table upon which it stands.

It was the object of the experiments detailed by the author to ascertain if the loss of acid, in consequence of the escape of gaseous emanations, was likely to amount to a quantity of importance; and next to determine if there were any marked difference in the composition of the dilute acid prepared by the present official process as compared with that made by the hitherto ordinary plan, namely, by the addition of the water simultaneously with the intermixture of the acids.

The following results illustrate the points alluded to:—Two acids were taken of a strength nearly approaching that indicated by the Pharmacopœia. They were mixed in the proportions ordered, allowed to stand for twenty-four hours in a stoppered Winchester quart (*i.e.*, in a vessel capable of holding about ten times the quantity), and the next day were diluted and at once tested.

Six fluid drachms required for neutralisation 808·64 grain-measures of the volumetric solution of soda.

Half the quantity was prepared in the same way in a Winchester quart. Of this, six fluid drachms took 828·69 grain-measures of the standard soda.

When the same acids were diluted before mixing, so that no preliminary decomposition was permitted, and tested in a similar way, it required 929 grain-measures of soda to saturate six fluid drachms.

By keeping the mouth of the bottle closed by a watch-glass during the whole of the twenty-four hours, and taking advantage of a cold night, the loss by vaporisation was considerably reduced.

The least unfavourable result obtained was as follows:—Two acids which, when mixed in pharmacopœial proportions but diluted at once with the water, required 904·3 grain-measures of soda to neutralise six fluid drachms, took for the same quantity, when made according to official directions, only 870·36 grain-measures.

It is to be observed that these are results obtained during cold weather in winter. They would, of course, be greatly exaggerated by a summer heat.

The author then discussed the question of the relative advantages of the two modes of mixing. The experiments made by him led to the conclusion that there is no advantage to be gained in the way of liberated chlorine by allowing the acids to decompose each other before adding the water, unless the liquid be employed immediately after the addition of the water.

The nitric and hydrochloric acids, after standing for about twenty-four hours as the Pharmacopœia describes, form a liquid which has long been known as Aqua Regia; it holds in solution hydrochloric and nitric acid, part of which has undergone change, producing chlorine and a compound which may be called nitric chloro-peroxide.

If this liquid be diluted with the proper quantity of water, and at once examined, it has these characters:—It bleaches litmus and indigo; it dissolves gold-leaf without the aid of heat; it instantly decolourises permanganate of potassium; mixed with iodide of potassium it sets free a large quantity of iodine, simultaneously causing an effervescence, due to the escape of a gas of which a considerable quantity was collected and proved to be nitric oxide.

The same acid, examined a few days afterwards, was still capable of bleaching and of dissolving gold, though less rapidly; but when mixed with iodide of potassium there was a much smaller amount of liberated iodine, and a bubble of gas no larger than a pea. In about a week change had progressed still further, and a very dilute solution of permanganate of potassium was only slowly affected by it. To compare with this some nitric and hydrochloric acids, of the same strength, were mixed with water in the pharmacopœial proportions. Freshly prepared, the mixture seemed to contain no chlorine, but after an interval of about ten days the reactions furnished by this liquid coincided perfectly with those obtained with the official preparation. The amount of chlorinous constituent indicated in both cases is minute.

When water is added to strong Aqua Regia, the nitric chloro-peroxide is resolved into hydrochloric, nitric, and nitrous acids. Afterwards the perchloride gradually reconverts the greater part of the nitrous into nitric acid.

The conclusions maintained by the author were that there is a loss sustained in following the directions of the Pharmacopœia, sufficient to render the nitro-hydrochloric acid a preparation variable in quality; also that there is no purpose served in delaying the addition of the water, unless the diluted product as administered has been quite recently prepared. He therefore recommends that the acids be diluted at once with the water, and stated that if the strong acids employed be of the prescribed degree of concentration, the result of such mixture will agree pretty accurately with the tests of density and saturating power indicated by the Pharmacopœia; far more nearly so, in fact, than the dilute acid prepared strictly according to official instructions.

Professor REDWOOD wished to know the exact difference, in reference to the chlorine, between the acid of the Pharmacopœia and that prepared by simultaneous mixture and dilution. Professor Redwood's experiments showed that if diluted first it would not dissolve gold-leaf until after two or three weeks. The object in the Pharmacopœia process was to get an acid which should at once contain free chlorine. If the action of the acid depended on the existence of free chlorine, the mixture may be effected first and dilution afterwards; and by the use of large stoppered bottles the preparation wanted might be obtained. If, however, time was no object, then the acid might be prepared by diluting the acids first and mixing afterwards.

Mr. TILDEN stated, that by diluting first, and then mixing, the same result as that attained by the Pharmacopœia process was obtained in about ten days.

The CHAIRMAN announced that the next meeting would take place on April 7.

MACHINERY EMPLOYED IN THE PREPARATION OF AËRATED WATERS.

BY MR. JOHN BRIGGS.*

EARLY SODA-WATER MACHINE.

THE machine used in the early manufacture of soda-water consisted, primarily, of a large wooden cylinder holding from 20 to 30 gallons. This was made of oak 2½ in. or 3 in. thick, bound with strong wrought iron hoops. The ends were prevented from being forced out by strong cast-iron plates with projecting lugs, through which were passed iron bolts extending the whole length of the cylinder, and fitted with nuts, by means of which the plates could be screwed up tightly against the ends. The cylinder enclosed an agitator, the spindle of which passed through a stuffing-box at one end. The required quantity of soda solution having been put into the cylinder, the atmospheric air was pumped out, so as to produce a partial vacuum and deprive the liquid of the air which it held in solution. Then, on opening a communication between the gasometer and the cylinder the carbonic acid gas rushed into the vacuous space. The force-pump was next employed to compress into the cylinder the quantity of gas required to aërate the soda solution, the agitator being either occasionally or continuously worked, by hand or other power, until the confined gas attained the proper pressure. The soda-water was drawn off by the bottler, and the carbonic acid gas remaining in the cylinder was either returned to the gasometer or allowed to escape, at the option of the manufacturer. The contents of the cylinder constituted "a batch," and the same series of operations had to be repeated before another batch was ready for bottling. It will be seen at once that this was a most tedious and wasteful process. The quantity of soda-water made and bottled per day by the aid of this primitive machine did not exceed 60 to 80 dozen, unless several bottlers were employed to draw off the contents of the cylinder. The most serious defects of the old process, however, was the gradual diminution of the pressure of the gas. Of course the pressure would decrease with every bottle drawn off unless it was kept up by the continuous action of the force-pump while the bottling was going on, and the result of all this pumping would be the accumulation of a large quantity of gas, which would have to be got rid of before another supply of solution could be introduced. If this gas was allowed to blow off the loss was serious, and if it was returned to the gasometer it probably became so much contaminated that it could not be safely used again. To save the gas the pressure was sometimes kept up by pumping in atmospheric air which, from its lower specific gravity, would remain at the top of the carbonic acid gas. Of course when this device was adopted the residual carbonic acid gas in the cylinder was rendered quite useless, and had to be wasted. Even at the present time some machines of this description are in use, and excellent soda-water is made with them. Those who use them assert that really good soda-water can only be made by the old process, but I cannot admit that this is the case. We do occasionally make these machines for those who are wedded to the old process, but most soda-water makers have given them up long ago on account of their obvious defects, and because they have found that the article produced by their aid is not superior to that made by the more expeditious and economical continuous process.

The cylinder machine has been superseded by a machine originally constructed by JOSEPH BRAMAH. This, which we now call BRAMAH'S ORIGINAL SODA-WATER MACHINE, was introduced as an improvement on that invented by Hamilton. There can be no doubt that Hamilton and Bramah perceived the defects of the machinery used, and saw that the improvement required was an arrangement that would permit the aërating and bottling to go on continuously and simultaneously. They found that the conditions under which this continuity of action could be realised were—that the pump should be capable of producing any amount of pressure, that the gas and the water should be pumped together, that there should be regulating cocks for supplying gas and water as fast as both were drawn off, that the receiver or condenser should be sufficiently strong to bear the required pressure, and lastly, that the liquid in the condenser should be continuously agitated to promote the solution of the gas. All these conditions are carried out in Bramah's continuous process machine, which is represented by an engraving which I shall refer to presently. One important feature of this machine is the peculiar construction of the pump. The piston is solid and works upwards, so that its upstroke corresponds to the downstroke of the piston of an ordinary force-pump. It is provided with a flexible collar, which is affected by the pressure in such a way that the piston becomes tighter as the pressure within the pump increases. The valves are in a suitable valve-piece, situated at the top of the pump, and are easily got at by simply removing a screw plug. It will be evident from this description that when the pump has drawn in its charge of gas and water by a downstroke, the water being the heavier will naturally be at the bottom surrounding the collar and thus preventing the escape of gas. Even should the collar become leaky nothing would escape but a few drops of water which would be of no consequence. Then, by the upstroke of the piston the gas is driven on first, and the water last, so that the most important material in the manufacture of aërated waters is effectively utilised without waste. In the old machine, the pump, though used for gas only, was open at the top, the piston being formed of leather, and the valves were situated at the bottom, where they could not be got at without removing the whole pump. The gas was drawn in at the upstroke and forced out at the downstroke, the prevention of escape depending entirely on the fit of the piston in the barrel, so that when the piston was old or defective there was necessarily an escape of gas, which represented a serious waste of material and also a considerable loss of time and power in getting up the required pressure. Then again, the old pump, unless surrounded by water, became heated by the condensation of the gas. The differences between this pump and that used in the continuous process need not be further dilated upon. I have said enough to show the superiority of Bramah's pump, which remains exactly as he left it, and is adopted in all the machines manufactured by our firm (Hayward Tyler and Co.)

The first machine on the continuous principle, made by Bramah, is represented in the following engraving, a *fac-simile* of which, taken from one of my own drawings, will be found in Dr. Ure's *Dictionary of Arts and Manufactures* (1840.)

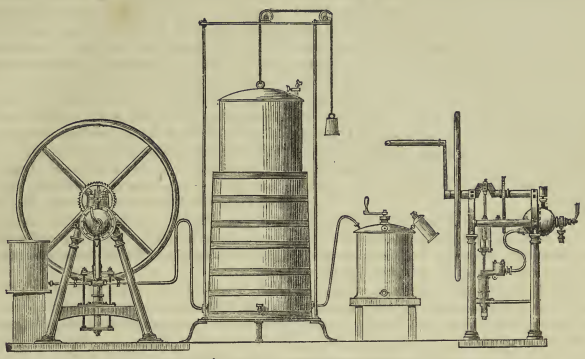
The only difference between this machine and those we are now manufacturing is in the design of the frame.

* From an unpublished comprehensive Treatise on the Machinery employed in the Preparation of Soda Water, etc., the manuscript of which has been placed at our disposal by Messrs. Hayward Tyler and Co. The author, Mr. Briggs, has been connected with the manufacture of Soda Water Machines for more than forty years. He commenced his active career in 1827, with Mr. Russell, of Clerkenwell, who had been a pupil of Bramah, the maker of the first Soda Water Machine on Hamilton's continuous principle. On the death of Mr. Russell, in 1835, Mr. Briggs became associated with the late Mr. Hayward Tyler, who purchased the business from the widow, and who on the close of Bramah's works became the sole manufacturer of Soda Water Machines, constructed according to Bramah's original patterns. When Mr. Tyler died, in 1855, the business was purchased by Mr. Robert Luke Howard, who was joined a few years afterwards by his brother Mr. Elliott Howard, and these gentlemen, who carry on business under the old title of Hayward Tyler and Co., still profit by the experience of a manager whose career is commensurate with the history of soda water machinery.

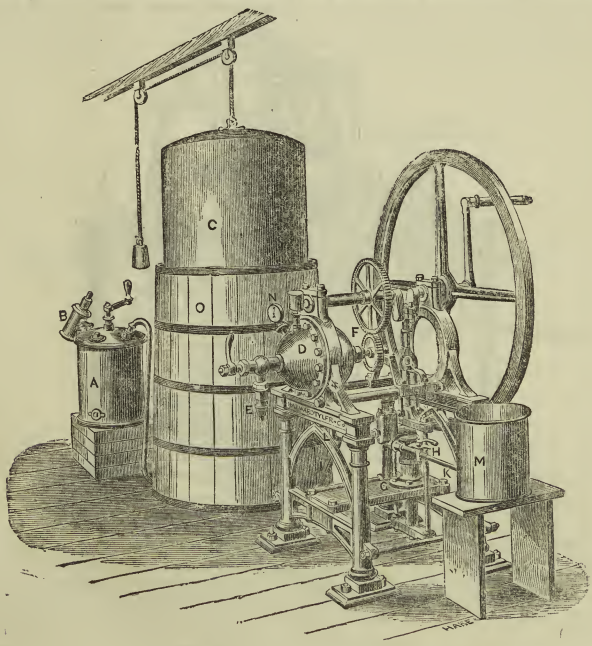
This was the first machine made by us from the patterns originally used by Mr. RUSSELL, of John-street, Clerkenwell, and copied by him from Bramah's. There is no necessity for entering into a detailed description of this machine, because all the essential parts will be referred to in connection with our No. 1 Machine, which has a frame of more modern design.

HAYWARD TYLER AND CO.'S NO. I. BRAMAH'S MACHINE.

This machine is the one in most general use, and is much larger and more strongly constructed than that previously figured. The condenser is formed of the best gun-metal, tinned inside, and is supported by a frame of great strength. The generator and gasometer exhibit a corresponding increase in capacity and strength. The capabilities of produc-



BRAMAH'S FIRST CONTINUOUS MACHINE.



HAYWARD TYLER AND CO.'S NO. I. BRAMAH'S MACHINE.

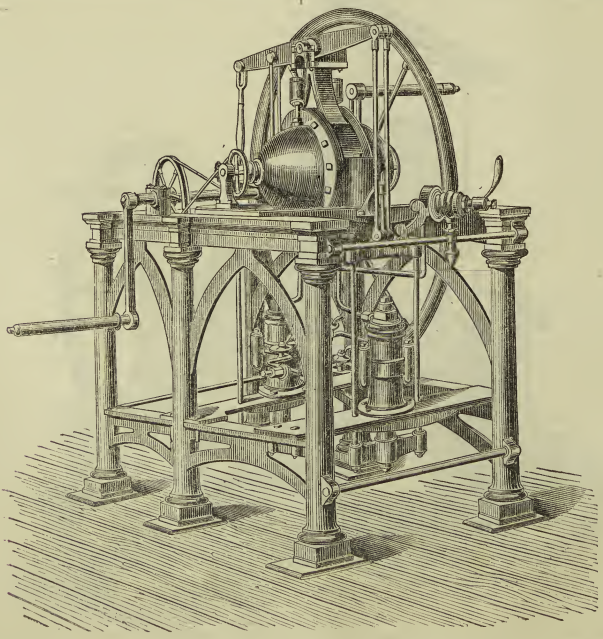
tion of this machine are fully equal to the exhausting powers of the bottlers. It is perfectly absurd to make statements to the effect that a machine will make more soda-water than it is possible for human strength to deal with, for the produce of a machine necessarily depends on the skill of the bottler and the speed at which it is driven. From 120 to 130 dozens of soda water is considered a fair day's produce, and a much better article can be made at this speed than at a higher one. Lemonade, gingerade, etc., can be bottled much faster, because less pressure is required with a smaller quantity of gas, and a more abundant supply of water. With this machine 20 or 30 dozens of such beverages per hour can be drawn off, or when steam power is used and a skilful bottler employed 300 dozens per day. The following detailed description of the parts shown in the engraving will explain the construction of the machine: —

A. *The Gas Generator.*—This is a strong cylindrical leaden vessel in which the carbonic acid gas is generated by the action of sulphuric acid upon whiting. The whiting, mixed with water, is put into the generator through a large aperture at the top which is afterwards closed by a strong cap and screw. Inside the generator there is an agitator or rouser formed of copper, with a copper rod passing through a stuffing-box at the top. By means of a handle on the rod this agitator can be worked as required in order to stir up the deposit of whiting. At the bottom of the generator there is an outlet for the spent whiting or sulphate of lime. The gas, as it is generated, passes into the gasometer through a bent pipe, one end of which opens into the top of the generator, and the other joins a pipe entering the gasometer.

B. *The Acid Bottle.*—This which is also made of lead is attached to the generator by a swivel joint. The sulphuric acid is introduced through an aperture at the top of the bottle while the latter is in the position shown in the engraving. The aperture being then closed by a cap and screw, the acid is let into the generator by occasionally tilting the bottle on one side or the other, and whenever this operation is performed a turn is given to the rouser in order to mix the acid with the whiting.

C. *The Gasometer.*—This is made of copper tinned inside. It works up and down in water contained in a strong iron-bound oak tub in which are fixed two copper pipes, one for the admission of the gas from the generator and the other for conveying it to the condenser. Both these pipes pass through the water above its surface, but the extremity of the former one is bent downwards into the water, so that the gas after its liberation from the generator may be washed and purified. A small cock fixed to the top of the gasometer serves to let off the atmospheric air at the first filling.

D. *The Condenser.*—This is made of the very best gun-metal well tinned inside. It is of an oval form and is put together in halves, each half having a strong flange by which it is screwed to the other. The halves can be easily taken apart for cleaning or fresh tinning, by removing the flange bolts. This oval condenser and the pump previously noticed are the most important parts of Bramah's machine. It is in the condenser that the water becomes aërated by pressure and agitation. For the latter purpose an agitator is kept constantly revolving inside while the condenser is being charged with gas and water. The spindle of the agitator



DOUBLE BEAM-ACTION MACHINE.

passes through a stuffing-box and is supported at its outer end by a suitable bracket. The condenser is also provided with a safety valve and pressure guage.

E. *The Discharge Valve or Bottling Cock.*—This is a cock provided with a nipple for hand or knee bottling.

F. *The Wheels for driving the Agitator.*—The large wheel is connected with the crank, and the smaller one with the spindle of the agitator, consequently the power that works the pump gives motions at the same time to the agitator.

G. *The Soda Water Pump.*—This may be termed the vital part of the machine, as the aërating process depends entirely on its efficient working. The piston is constructed of the best gun-metal, and, as shown in the engraving, is at the bottom of the cylinder. The valves are at the top, in a suitable valve-piece, also of gun-metal.

H. *Regulating Cocks,* for admitting into the pump the gas and water which pass out together into the condenser. Connected with regulating cocks are two pipes, namely:—

I. *Lead Pipe,* to convey the gas from the gasometer.

K. *Copper Pipe,* to convey the water from M, the solution pan.

L. *Tinned Copper Pipe,* through which the gas and water pass together from the pump to the condenser.

PATENT BEAM ACTION MACHINE.

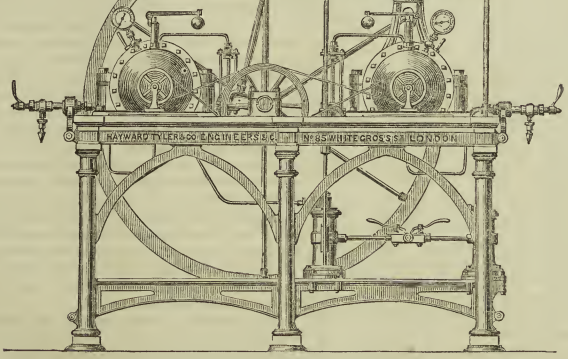
This machine was patented by the late Hayward Tyler in 1840. It is on the continuous principle, and like Bramah's machine, it has a pump with a solid piston working from below. On each side of the pump are placed suction-valves, one for gas, and the other for water, in suitable valve-pieces with regulating cocks. The outlet or delivery valve is on the top of the pump, in a gun-metal chamber, with a pipe attached to convey the gas and water to the globe. The latter is mounted on a suitable carriage, on the top of which are bearings for the beam gudgeon. Motion is given to the pump piston, up end down, by the oscillation of the beam, one end of which is connected by a rod with the crank, and the other to the side rods attached to the guide frame of the piston. The bottling cock is at one end of the frame and the crank shaft at the other. This arrangement admits of the use of two handles, one on each end of the crank shaft, so that where hand-power only can be applied, two men may work the machine with advantage. The first machine of this kind made was sold to Mr. Martindale, of Liverpool.

DOUBLE BEAM-ACTION MACHINE.

This machine differs from that just described in having two pumps worked from the same beam, and a double condenser. The latter has more than twice the capacity of the ordinary condenser, and is divided by a partition in the centre, so that there are virtually two separate condensers, each of which is connected with its own pump. There are two bottling cocks, one at each end of the condenser. The double machine, therefore, consists of two complete machines set in one frame, and so connected with the driving gear that they may be worked together or separately. It is obvious that this machine is admirably adapted for a large business; for though it occupies very little more space than a single machine, it will produce twice as much soda-water in the same time if two bottlers be set to work.

DOUBLE MACHINE WITH TWO CYLINDERS.

This is a modification of the double machine just described. Instead of a divided condenser, there are two extra large gun-metal cylinders, each of which is connected with its respective pump. This machine has all the requisite fittings to make it perfect. Each condenser is provided with a water and pressure gauge, the former to show the height of the water, and the latter to indicate the exact pressure. The condensers hold a large quantity of water, and it is the opinion of many soda-water makers that the presence of a large volume of water in the condenser facilitates the production of soda-water of uniform strength. The united machines can be worked together or separately; moreover, one of the cylinders can be supplied with solution of soda while the other is receiving plain water, so that the manufacture of soda-water and the manufacture of lemonade, or other kind of aërated water, may be carried on simultaneously.



DOUBLE MACHINE WITH TWO CYLINDERS.

This machine, like the former, is well adapted for a large manufactory. Messrs. Ellis and Son, of Ruthin, have at the present time three double-machines, two with partitioned condensers, and one with the separate cylinders, and these keep six bottlers employed. The whole of the machinery, including the steam engine and shafting, in Messrs. Ellis and Son's manufactory, was constructed by our firm.

(To be concluded in our next.)

PHARMACY PAST AND PRESENT.

BY SAMUEL B. TURNEY, PLYMOUTH.*

IN early times pharmacy was in the hands of the physician. Galen attemps to show that Hippocrates made up his own prescriptions, and the latter in one of his works gives directions for the necessary articles for a physician to keep in his shop. But not to go so far back into antiquity, we find that in the year 1511 the first act was passed which recognised the medical profession; it was directed against unskilled persons and women, who introduced witchcraft and sorcery; it enacted that "no person within the City of London, or a circuit of seven miles, shall practice either as a physician or surgeon, till he have been examined and approved by the Bishop of London or Dean of St. Paul's, assisted by four physicians or surgeons of established reputation." These physicians practised medicine, surgery, and pharmacy; their assistants were called apothecaries, who, in course of time, began to practise on their own account. The physicians soon got jealous of this encroachment of the apothecary, and early in the reign of Queen Mary obtained an act prohibiting both surgeons and apothecaries practising physic. This took place thirty-seven years after the formation of the College of Physicians, which was established in 1518. This act reduced the apothecary to the mere druggist, or I think we might say general shopkeeper, who had but few ideas beyond his mortar. They (the apothecaries) formed a guild with the grocers, but did not remain long so united, having obtained a distinct charter of incorporation in the reign of James I.; their separation from the grocers being effected in the year 1617. From the time they had thus become organised, their influence increased, and they were better able to carry on war with the physicians. Up to this time there was no authorised formula to guide the dispensers or pharmacists of that day. The old pharmaceutical catalogues were emphatically full of horrors, consisting of such articles as earthworms, vipers skinned, human skulls, dried blood, and others even more repulsive. The remedies seem to have been chosen not on account of any especial benefit of them, but solely because of the correspondence supposed to exist between them and the disease they were intended to combat; thus, in affections of the liver, a dried wolf's liver and a donkey's liver pounded in honey were prescribed, and for consumption prepared foxes lungs. Patients in the present day are very clever in deciphering prescriptions, but I think they would be puzzled at meeting with the terms "mus combustus" or "pulmoneres preparata," and an hysterical lady would probably prefer the modern "sal volatile" to the old remedy of "dried serpents' tears."

It was in this century an enthusiast named Paracelsus sprung up. Before his time the authority of Galen was paramount. In the treatment of diseases the followers of the latter trusted almost entirely to simples, whereas the chemical sect, with Paracelsus at their head, despising these derived their most powerful remedies from the mineral kingdom, and prepared them by complex processes. And however absurd were the doctrines of Paracelsus, and however empirical were a great many of his remedies, he and his followers were the means of introducing many active and useful remedies into the materia medica, and we owe much to their labours for many important discoveries in chemistry. Paracelsus was the first to use mercury internally, and he also gives us directions for making red precipitate from mercury and aqua fortis. The introduction of chemical remedies into the practice of medicine gave rise to the celebrated contest between the Galenical and chemical sects, which was carried on for nearly two centuries with all that virulence of party spirit so characteristic of the ignorance of the age.

In the year 1618 the first Pharmacopœia was published under the authority of the College of Physicians; this was reprinted with alterations in 1621. In the officinal list of the materia medica the animal kingdom was largely represented, and many of the remedies of the preceding century were retained; for we find that Nicholas Culpepper, gentleman student in physic and astrology, as he styles himself, thus ridicules some of the contents of the materia medica, inserting his own comments in parenthesis.

The list runs thus :—The fat, grease, or suet of a duck, goose, eel, bear, heron, thymallos (if you know where to get it, adds Mr. Culpeper), dog, capon, beaver, wild cat, stork, hedgehog, hen, man, lion, hare, kite or jack (if they have any fat, says Mr. Culpeper, I am persuaded it is worth twelve pence per grain), wolf, mouse of the mountain (if you can catch them), pardal, hog, serpent, bear, fox, vulture (if you can catch them); east or west benzoar; viper's flesh, the brains of hares and sparrows, the rennet of a lamb, kid, hare, calf, and horse—and here Mr. Culpeper very quaintly remarks that the physicians should have put the rennet of an ass to make medicine for their addled brains; though if he could have looked into futurity, he would have seen that the rennet of a calf is not despised in the present day as a remedy for indigestion.

But after all, our ancestors had some pleasant remedies which seemed to call into requisition the services of the cook rather than that of the pharmacist. Thus in an old book, published two centuries ago, containing nearly eight hundred prescriptions, and bearing on its title-page this inscription, "A rich storehouse or treasurie for the diseased, wherein are many approved medicines for divers and sundry diseases, which have been long hidden and not come to light before this time; first set forth for the benefit of the poorer sorts of people, that are not of abilitie to give to the physician." I find amongst others of a similar nature, a receipt for making a quart of excellent good jelly for a man in consumption. The ingredients are a leg of veal, a capon, a bottle of hock and moselle, with sugar and eggs. The directions are rather complicated, but the result, if satisfactory, might well be termed a "compound extract of meat." The writer adds, "if the patient eats thereof cold, he shall receive much comfort thereby; this is also good for many other diseases." Other receipts in the same and similar works have been handed down to posterity, for we may recognise many of them under the name of "old women's remedies;" and though in this nineteenth century we do not hear of such remedies as the powder of the skull of a man that has been hanged, being taken as a cure for epilepsy, yet we often hear of others used by the unlearned in our villages and country towns which, in the light of existing knowledge, look quite as absurd as those in vogue at the period to which I allude.

Adulteration and sophistication seem to have been carried on then as now. Dr. Merrett, in 1669, charges apothecaries with substituting myrtle leaves for senna leaves, a binder for a purger, sheeps' lungs for foxes' lungs, and the bone of an ox's heart for that of a stag's heart.

From the time of their incorporation, in 1617, the apothecaries gained in number and influence; having first established a dispensary and then added a laboratory to the dispensary, and the growth of the middle classes rendered the apothecary as a mecical practitioner a necessity; the physicians tried to reduce them to their original level, and

* Report of a lecture delivered at the last monthly meeting of the Plymouth, Devonport and Stonehouse Association of Chemists and Druggists.

not only contested the right of apothecaries to advise, but in the heat of the controversy went so far as to decree that no surgeon or apothecary should be admitted into the class of candidates or fellows. War was thus declared, pamphlet upon pamphlet was written and replied to, the physician considering it beneath his dignity to dispense his own medicines was obliged to be heedful of the disposition of the apothecary towards him, otherwise active medicines were purposely made inert by the latter; if, on the other hand, the physician and apothecary were good friends, the former wrote well to the profit of the latter. As an instance of this I have an account of only one day's medicine prescribed by the physician and sent by the apothecary to a fever patient, the list on each other day being quite as long. I will not take up your time by quoting the various items in the account, but will merely state that it consisted of thirteen draughts, juleps, and emulsions, one glass of cordial spirits, two boluses, and five external applications, the sum total for which amounts to £3 2s. 4d.

Truly, these were the palmy days of physic; and well might Dr. Garth, one of the disputants, and who wrote a poem entitled the "Dispensary," observe,—

> "Some fell by laudanum and some by steel,
> And death in ambush lay in every pill,
> The piercing caustics ply their spiteful power,
> Emetics wrench, and keen cantharitics scour,
> The deadly drugs in double doses fly,
> And pestles peal a martial symphony."

The upshot of the controversy was that the physicians, I am disposed to think, from other motives as well as benevolent ones, established dispensaries, to which they sent their wealthy as well as poor patients, supplying medicines at a very reduced price; these dispensaries were resorted to by all classes as druggists' shops, at which the apothecaries were competed with and undersold by the faculty. A war of tongues and pamphlets followed this measure; the physicians giving as reasons the bad quality of the drugs supplied by the apothecaries, and their extortionate charges. The apothecaries were not slow to answer this, denying the first, and in the latter case saying, that when a physician got his guinea it concerned not his honour or conscience how the apothecary got his shilling. The dispute was ended by a final effort of the physicians to test in a court of law the right of the apothecary to advise, and was decided in favour of the latter; and it was then established that not only could the apothecary dispense but might direct and order the remedies employed. This took place in the year 1704. I have dwelt on this controversy, because I think we may date our origin from it. It is supposed that the assistants in these dispensaries, together with some apothecaries who thought it policy to abandon practice, became dispensing chemists on their own account.

In the year 1748 the apothecaries obtained a charter empowering them to license members of their own body, and to search shops in London and within a circuit of seven miles; and to show how this power was exercised a case is on record, where the censors visited an apothecary's shop and condemned, not for the first time, the shopkeeper's mithridate; when he was asked for the customary fine of six shillings he said, "Now I know what a nest of villains I have to deal with, who, being nettled at my refusing their usual imposition, begin to show their knavish tricks by condemning medicines of their own compounding," proving his words by showing the invoice and calling the porter who had fetched the mithridate from the Hall. The mithridate took its name from Mithridates, king of Pontus and Bythuna, who took a dose every morning to guard against poison; it originally consisted of three or four simple ingredients, it was afterwards altered and the number increased to 61; in this form it was an aromatic opiate, our confection of opium being a simplification of the same.

In course of time the apothecary paying more attention to medical practice than to pharmacy and dispensing, neglected the trading part, greatly to the advantage of the chemist and druggist; wishing for the monopoly, the apothecaries began to get jealous of what they termed the encroachment of the chemist and druggist. It was intended by the charter of 1748 to prevent the latter practising pharmacy, and physicians and surgeons selling the medicines they prescribed, and as they found it impossible to prevent this being evaded, they formed an association to investigate the subject, and a committee was appointed who undertook to collect evidence as to ignorance and inefficiency of the druggists; this was effected by information no doubt willingly given by provincial practitioners. Amongst the many instances adduced was the one with which I have no doubt many of you are familiar, of a chemist in Worcestershire sending to other establishments for some "tincture ejusdem," which was ordered in a prescription. The committee in their report said, that the increase of chemists and druggists required particular attention, but whatever attention they might have paid to the matter they were not able to effect the subjugation of the chemist and druggist, for it was about this time they began to take their rightful position as dispensers of medicine.

The author then reviewed the measures which had been since introduced for the regulation of the sale of drugs referring especially to the proposed legislative measure of 1841, and in conclusion remarked:—Of late the practice of pharmacy had made great steps in advance, and in consequence our position now is very different to what it was formerly. The reasons are obvious; there are more thinkers amongst us, not theorists only, but men who reduce their thoughts to practice, and not as formerly was the case keep the results to themselves, but publish them for the benefit of others. This has mainly been effected by association; in the first case by the Pharmaceutical Society, again by local associations, and lastly by the establishment of the Pharmacentical Conference. Who that has read the report of the papers delivered at various times before the Conference, has not felt that after all there is something more than mere mechanical labour in the practice of pharmacy, and if our calling is an arduous and responsible one, it calls forth intellectual qualifications that raises us above the rank of other trades. Again, our position as regards the medical profession is very different to what it formerly was; instead of that opposition hitherto offered to the advancement to the chemist and druggist, I think that, with few exceptions, the medical practitioners begin to see that the higher our education as pharmacists, the less likelihood is there of our encroaching on their province. The Act now in force gives us an acknowledged position, and it remains with us personally as individuals, and collectively as an association, to maintain and improve it. I consider I should be exceeding my province by saying how this is to be accomplished, but I think that the mutual good understanding likely to accrue from our meeting together and an interchange of ideas will in a great measure effect this object. Pharmacy is now in a state of transition, and that the greatest benefit of the change will be felt by our assistants and apprentices there cannot be a doubt. I dare say, if some of us will look back to the days of our apprenticeship, and we shall remember that we learnt the mechanical part of the trade only; or, in other words, learnt our trade as druggists, but knew nothing of our profession as pharmacists, and that not so much from absence of will but from

want of guidance, and in some cases a positive discouragement on the part of the master; the consequence was that we were obliged to go through, as it were, a second apprenticeship to enable us to keep pace with the progress of the times, but it is not so now. The master, to a certain extent, is bound to give his apprentice every reasonable opportunity of acquiring the necessary knowledge to qualify himself for examination; and I think our associates here are fortunate in having the privilege of attending those admirably conducted classes, in connection with the school of science, on chemistry and botany, and I am well assured that the knowledge there acquired, with a due amount of application, will be quite sufficient to enable them to pass in these particular branches. I trust also we shall soon be enabled to make our association a source of great usefulness and instruction to them. And here allow me to suggest that perhaps it would not be amiss for us to consider this evening the possibility of forming a materia medica class, and should that at present not be practicable, whether a series of special readings for associates could not be established, these readings to be explanatory of the materia medica and processes of the pharmacopœia. I am convinced if some plan of this kind can be carried out it will prove of great benefit to them, and would probably act as an incentive for further study; for I well know the difficulty a youth has to encounter whilst reading a work on materia medica or chemistry, in separating the essential from the non-essential, very often puzzling his brains over the latter to the exclusion of the former.

As I have before remarked, it is the younger members of our calling who will feel the full benefit of the working of the Pharmacy Act of 1868. They will only have to compete with men of equal position with themselves, and in however small a way of business they may commence, will have the satisfaction of knowing they will not have as an opponent one that was formerly a surgeon's errand-boy, or apprentice of a general shopkeeper, who, having a small sum of money to invest, opens business as a dispensing chemist. This state of things is past; every succeeding chemist must be educated up to a certain point, but I do not think the majority will be satisfied with this, but will go in for the higher grade, and the knowledge thus gained will grow and expand, and then if the comparison is drawn between the continental *pharmacien* and the English pharmacist, it will not be to the disparagement of the latter.

At the close of the lecture an interesting and animated discussion took place. The attention of the meeting was called to some new remedies which had been placed on the table by Mr. Balkwill. A vote of thanks to the lecturer was passed by acclamation. The president, in conveying the vote, expressed his high opinion of the value of the lecture, and warmly eulogised the suggestion to establish a materia medica class. We are informed that steps were taken after the lecture to give practical effect to the suggestion.

POISONOUS DYES.*

At a meeting of the Académie Impériale de Médecine, held on the 23rd of February, M. Tardieu made a further communication touching the poisonous action of some modern dyes. He reminded his hearers that M. Cerise had confirmed his former statements respecting the poisonous nature of coralline by calling the attention of the Académie to a case of such poisoning produced by wearing socks dyed with this substance; and said further, that Dr. Despaulder had had a marked case of the same kind, which, however, had not been published. Another case of a little girl who had suffered from the characteristic cutaneous eruption, brought on by wearing some garments dyed with coralline, of English manufacture, had been brought under his notice by Dr. Michalski, of Vierzon. These cases are examples of a special kind of poisoning, by means of a special poison—coralline—and are to be carefully kept distinct from other cases of a different kind, which M. Tardieu referred to. He mentioned that Dr. Viaud Grand-Marais, Professor in the Medical School of Nantes, had met with a case in which the poison contained in a dyed shirt was not coralline, but magenta, the well-known aniline-red. The poison in this case was the arsenic contained in the magenta, so that, strictly speaking, it was an example of arsenical poisoning. M. Tardieu called attention to the well-known fact of the employment of arsenic in the manufacture of magenta, and remarked that, despite all processes of purification, this dye almost invariably contains arsenic. In order to facilitate the collection of information relative to poisoning by means of dyes, and to avoid confusion, M. Tardieu gave a brief *resumé* of the distinctive chemical characters of the different organic red dyes to be met with in commerce. These dyes are six in number—garancine (madder), cochineal, murexide, carthamine, magenta, and coralline. The first three cannot be used in dyeing without a mordant; the last three are taken up by woollen or silk fabrics without it being necessary to employ a mordant. 1. Garancine (madder) is the most fixed of all the organic red dyes; it is not altered by a solution containing three or four per cent. of hydrochloric acid or of ammonia. 2. Cochineal is turned violet by ammonia, and at the same time communicates a bright violet colour to the ammoniacal liquid. 2. Murexide is bleached by citric acid. 4. Carthamine is decolourised by a short boiling with a weak solution of soap (about one part of soap in two hundred of water is enough). 5. Magenta is decolourised by ammonia. 6. Coralline is not diminished in intensity by contact with alkaline fluids. It is dissolved off the fabric by means of boiling alcohol, giving a red liquid, which is *intensified* by ammonia or potash, a character which at once distinguishes it from magenta. At the same meeting of the Académie, M. Chevallier observed that the confectioners who had been in the habit of colouring bon-bons with magenta had received orders to substitute some other dye for that purpose.

Mr. Wanklyn, whose communications respecting the dangers of the modern dyes will be remembered, and who was, we believe, the first to point out the danger of arsenical poisoning by means of magenta-dyed underclothing, writes to us to say that a composite dye is now very much in vogue, consisting of magenta, tinted with some orange-colouring matter. This dye, a splendid scarlet, very much used for underclothing, is doubly poisonous, and exposes the unfortunate wearer to the risk of being poisoned by arsenic, and the risk of being poisoned by an irritant orange dye.

* *British Medical Journal*, March 6.

CONSUMPTION OF ALCOHOL.

A DISCUSSION having arisen in the columns of the *Times* as to the amount of alcohol consumed by the population of the United Kingdom, Mr. Dawson Burns shows that the question is simply one of arithmetic applied to the data officially furnished, and contends that there ought not to be a great difference of opinion in relation to the facts. He says:

"The trade and navigation returns just published enable us to come to an approximate conclusion concerning the consumption of alcohol in 1868. The British spirits retained for use as beverage last year were 21,008,634 gallons, and the

imported spirits charged duty for consumption were 8,404,519 gallons—a total of 29,413,153 gallons. This spirit was taxed at 'proofs,' which consists by volume, of 57 parts of alcohol, and 43 of water.

"The alcobol contained in the above quantity of spirits was, therefore, 16,765,495 gallons. The bushels of malt charged duty for consumption as beer were 48,119,033, and the sugar used in brewing was 351,742 cwt. According to the Excise estimate, the barrels of beer produced from this material were 24,878,871=895,639,356 gallons, and at an average of 5 per cent. of alcohol in this malt liquor, the gallons of alcohol thus created and consumed were 44,781,968. The gallons of foreign wines entered for home consumption in 1868 were 15,151,741, the alcoholic strength of which may be moderately placed at 15 per cent., equal to 2,272,755 gallons of pure alcohol.

"Adding these totals, we have an aggregate consumption of 63,820,190 gallons of alcohol, or nearly twice that quantity of proof spirits, affording an average of more than two gallons of neat alcohol, or fully four gallons of proof spirit to every inhabitant of the British Isles in 1868. It is probable, however, that one-third of the population are non-consumers of alcohol, either on account of age or conscientious objection; and estimating the habitual users of alcohol in the United Kingdom at 21,000,000, there will have been in 1868 an average appropriation of three gallons of alcohol to each person, or about double that quantity of proof spirits."

MICHAEL FARADAY

BY DR. H. BENCE JONES, F.R.S.*

Æt. 24 (1816.)

ON the 17th of January, 1816, Faraday began a course of seventeen Lectures on Chemistry, at the City Philosophical Society, which extended over two years and a half. He called them "an account of the inherent Properties of Matter, of the forms in which matter exists, and of simple elementary substances." During the year he gave six or seven lectures on the general properties of matter, on the attraction of cohesion, on chemical affinity, on radiant matter, on oxygen, chlorine, iodine, and fluorine, on hydrogen, and on nitrogen. He wrote his first lectures at full length, whilst of the latter lectures he only made notes, putting the experiments very distinctly apart, and he kept very much to this plan during the rest of his life.

It was in this year also that Faraday published his first paper, an analysis of native caustic lime, in the Quarterly Journal of Science. In the volume of his 'Experimental Researches on Chemistry and Physics,' he has added a note:—"I reprint this paper at full length: it was the beginning of my communications to the public, and in its results very important to me. Sir Humphry Davy gave me the analysis to make as a first attempt in chemistry, at a time when my fear was greater than my confidence, and both far greater than my knowledge; at a time, also, when I had no thought of ever writing an original paper on science. The addition of his own comments, and the publication of the paper, encouraged me to go on making, from time to time, other slight communications, some of which appear in this volume. Their transference from the 'Quarterly' into other journals increased my boldness, and now that forty years have elapsed, and I can look back on what successive communications have led to, I still hope, much as their character has changed, that I have not either now or forty years ago been too bold."

Early in February he thus wrote to his friend Abbott:—"Be not offended that I turn to write you a letter, because I feel a disinclination to do anything else; but rather accept it as a proof that conversation with you has more power with me than any other relaxation from business,—business I say: and I believe it is the first time for many years that I have applied it to my own occupations. But at present they actually deserve the name; and you must not think me in a laughing mood, but in earnest. It is now 9 o'clock p.m., and I have just left the laboratory and the preparation for to-morrow's two lectures. Our double course makes me work enough; and to them add the attendance required by Sir H. in his researches, and then if you compare my time with what is to be done in it, you will excuse the slow progress of our correspondence on my side. Understand me, I am not complaining; the more I have to do the more I learn, but I wish to avoid all impression on your side that I am lazy—suspicions, by-the-by, which a moment's reflection convinces me can never exist."

In consideration of the additional labour caused to him by Mr. Brande's lectures in the laboratory, his salary at the Institution was increased to £100 per annum.

This year Faraday began a common-place book, in which he continued to make entries on all subjects for fifteen years. Some of the earliest are on the production of oxygen, on the combustion of zinc and iron in condensed air, on a course of lectures on geology delivered at the Royal Institution by Mr. Brande, and an account of Zerah Colburn, thirteen years old, the American calculating boy. Sir H. Davy sent him with a note, saying "his father will explain to you the method the son uses, in confidence; I wish to ascertain if it can be practically used."

He wrote in this year:—"When Mr. Brande left London in August, he gave the Quarterly Journal in charge to me; it has very much of my time and care, and writing through it has been more abundant with me. It has, however, also been the means of giving me earlier information on some new objects of science."

Æt. 25 (1817.)

In 1817 he gave five lectures at the City Philosophical Society on the atmosphere, on sulphur and phosphorus, on carbon, on combustion, and of the metals generally. He had a paper in the Quarterly Journal on the escape of gases through capillary tubes. The entries in his common-place book consist of geological notes of South Moulton Slate, Tiverton, Hulverston, Taunton, Somerton, and Castle Cary; a multitude of chemical queries or questions to be worked at, among which are the exciting effects of different vapours and gaseous mixtures; compounds of chlorine and carbon made out in the autumn of 1820; electricity, magnetism; a pyrometer; extracts from Shakespeare, Lalla Rookh, Rambler, &c.

At the end of the year he tells his friend Abbott that he can see less of him, "in consequence of an arrangement I have made with a gentleman recommended to me by Sir H. Davy; I am engaged to give him lessons in mineralogy and chemistry, three times a week, in the evenings, for a few months.

Æt. 26 (1818.)

In 1818 five lectures were given by Faraday at the City Philosophical Society, on gold, silver, &c., on copper and iron, on tin, lead, and zinc, and on alkalies and earths. He had six papers in the Quarterly Journal, of which the most important was on sounds produced by flame in tubes.

In his common-place book there is a long course of lectures on oratory, by Mr. B. H. Smart; questions for Dorset-street; an experimental agitation of the question of electrical induction, "Bodies do not act where they are not—query, is not the reverse of this true? Do not all bodies act where they are not; and do any of them act where they are? Query, the nature of courage; is it a quality or a habit?" Chemical questions.

On July 1st he gave a lecture to the City Philosophical Society. It is entitled "Observations on the Inertia of the Mind." As this lecture is wholly written out, it probably was one of the essays contained in the class-book of the Society.

Towards the end of the year Faraday wrote his first letter to M. G. De la Rive, the father of the present M. Auguste De la Rive. He says.—

"Dear Sir,—Your kindness, when here, in requesting me to accept the honour of a communication with you on the topics which occur in the general progress of science, was such as almost to induce me to overstep the modesty due to my humble situation in the philosophical world, and to accept of the offer you made me. But I do not think I should have been emboldened thus to address you had not Mr. Newman since then informed me that you again expressed a wish to him that I should do so; and fearful that

* Continued from page 120.

you should misconceive my silence I put pen to paper, willing rather to run the risk of being thought too bold than of incurring the charge of neglect towards one who had been so kind to me in his expressions. My slight attempts to add to the general stock of chemical knowledge have been received with favourable expressions by those around me; but I have, on reflection, perceived that this arose from kindness on their parts, and the wish to incite me on to better things. I have always, therefore, been fearful of advancing on what has been said, lest I should assume more than was intended; and I hope that a feeling of this kind will explain to you the length of time which has elapsed between the time when you requested me to write and the present moment when I obey you.

"I am not entitled, by any peculiar means of obtaining a knowledge of what is doing at the moment in science, to deserve your attention, and I have no claims in myself to it. I judge it probable that the news of the philosophical world will reach you much sooner through other more authentic and more dignified sources, and my only excuse even for this letter is obedience to your wishes, and not on account of anything interesting for its novelty." He then describes a new process for the preparation of gas for illumination. He ends, "I am afraid that, with all my reasons, I have not been able to justify this letter. If my fears are true I regret at least; it was your kindness that drew it from me, and to your kindness I must look for an excuse."

Æt. 27 (1819.)

In 1819 he had no paper in the Quarterly Journal. He gave one lecture to the City Philosophical Society on the Forms of Matter. Matter he classifies into four states, which depend on differences in the essential properties, and cautiously says, "thus a partial reconciliation is established to the belief that all the variety of this fair globe may be converted into three kinds of radiant matter."

His common-place book contains scarcely any scientific notices.

On July the 10th he started by coach for a three weeks' walking tour in Wales, with his friend Magrath. He kept a journal, and his descriptions of the scenery, of the copper works of Swansea, the mines of Anglesea, and the slate quarries of Bangor, are still of interest.

Æt. 28 (1820.)

This year was one of the most important in the life of Faraday; he had his first paper read to the Royal Society on two new compounds of chlorine and carbon, and on a new compound of iodine, carbon, and hydrogen; and with Mr. Stodart, the surgical instrument maker, he published, in the Quarterly Journal of Science, experiments on the alloys of steel, made with a view to its improvement.

In his common-place book, among the chemical questions, we find chemical lessons, or a plan of lessons in chemistry, and processes for manipulation, the germ of his work on Chemical Manipulation. There is also a list headed "Lecture subjects," including application of statics to chemistry, approximation of mechanical and chemical philosophy, application of mathematics to actual service and use in the arts, series of mechanical arts, as tanning.

On the 20th of April he writes to M. G. De la Rive:—"I never in my life felt such difficulty in answering a letter as I do at this moment your very kind one of last year. I was delighted on receiving it to find that you had honoured me with any of your thoughts, and that you would permit me to correspond with you by letter. Mr. Stodart and myself have lately been engaged in a long series of experiments and trials on steel, with the hope of improving it, and I think we shall in some degree succeed. We are still very much engaged in the subject; but if you will give me leave I will, when they are more complete, which I expect will be shortly, give you a few notes on them. I succeeded by accident a few weeks ago in making artificial plumbago, but not in useful masses. We have lately had some important trials for oil in this metropolis, in which I, with others, have been engaged. They have given occasion for many experiments in oil, and the discovery of some new and curious results; one of the trials only is finished, and there are four or five more to come. As soon as I can get time, it is my intention to trace more closely what takes place in oil by heat."

June 26 he sends a long abstract of the paper on Steel, and ends:—"Now I think I have noticed the most interesting points at which we have arrived. Pray pity us, that after two years' experiments we have got no further; but I am sure if you knew the labour of the experiments you would applaud us for our perseverance at least. We are still encouraged to go on, and I think the experience we have gained will shorten our future labours.

"If you should think any of our results worth notice in the 'Bibliothèque,' this letter is free to be used in any way you please. Pardon my vanity for supposing anything I can assist in doing can be worth attention; but you know we live in the good opinion of ourselves and of others, and therefore naturally think better of our own productions than they deserve."

Early the following month there is evidence that an entire change took place in the state of his mind. Among his friends was Mr. Edward Barnard, one of a family living in Paternoster-row, with which he had long been intimate, and which agreed with his own family in its religious views. Faraday proposed to, and ultimately was accepted by, Mr. Barnard's sister, Sarah.

Æt. 29 (1821.)

March 11, Sir H. Davy wrote:—"Dear Mr. Faraday, I have spoken to Lord Spencer, and I am in hopes that your wishes may be gratified; but do not mention the subject till I see you." This wish was probably to bring his wife to the Institution. In June he was appointed superintendent of the house and laboratory, in the absence of Mr. Brande.

All obstacles were removed, and the marriage took place on the 12th of June. Mr. Faraday, desiring that the day should be considered just like any other day, offended some of his near relations by not asking them to his wedding.

In a letter to his wife's sister, previous to the marriage, he says, "There will be no bustle, no noise, no hurry occasioned even in one day's proceeding. In externals, that day will pass like all others, for it is in the heart that we expect and look for pleasure."

A month later, at a meeting of the congregation, he was fully admitted as a member of the Sandemanian Church.

His common-place book shows that he read little. In a letter, May 19, to M. G. De la Rive, he says, "Mr. Stodart and myself are continuing our experiments on steel, which are very laborious."

On July 12, a paper was read to the Royal Society on a new Compound of Chlorine and Carbon, by Phillips and Faraday. This, as well as Faraday's previous paper on two Chlorides of Carbon, was printed in the Philosophical Transactions. In the Quarterly Journal he had a short paper on the Vapour of Mercury at common temperatures.

On the 12th of September he writes the following letter to M. G. De la Rive:—

"You partly reproach us here with not sufficiently esteeming Ampère's experiments on electro-magnetism. Allow me to extenuate your opinion a little on this point. With regard to the experiments, I hope and trust that due weight is allowed to them; but these you know are few, and theory makes up the great part of what M. Ampère has published, and theory in a great many points unsupported by experiments, when they ought to have been adduced. At the same time, M. Ampère's experiments are excellent, and his theory ingenious; and for myself, I had thought very little about it before your letter came, simply because, being naturally sceptical on philosophical theories, I thought there was a great want of experimental evidence. Since then, however, I have engaged on the subject, and have a paper in our Institution journal, which will appear in a week or two, and that will, as it contains experiments, be immediately applied by M. Ampère in support of his theory much more decidedly than it is by myself. I intend to enclose a copy of it to you, and only want the means of sending it.

"I find all the usual attractions and repulsions of the magnetic needle by the conjunctive wire are deceptions, the motions being not attractions or repulsions, nor the result of any attractive or repulsive forces, but the result of a force in the wire, which, instead of bringing the pole of the needle nearer to or further from the wire, endeavours to make it move round it in a never-ending circle and motion whilst the battery remains in action. I have succeeded not only in showing the existence of this motion theoretically,

but experimentally, and have been able to make the wire revolve round a magnetic pole, or a magnetic pole round the wire, at pleasure. The law of revolution, and to which all the other motions of the needle and wire are reducible, is simple and beautiful. Conceive a portion of connecting wire north and south, the north end being attached to the positive pole of a battery, the south to the negative; a north magnetic pole would then pass round it continually in the apparent direction of the sun from east to west above, and from west to east below. Reverse the connections with the battery, and the motion of the pole is reversed. Or if the south pole is made to revolve, the motions will be in the opposite directions, as with the north pole.

"If the wire be made to revolve round the pole, the motions are according to those mentioned. For the apparatus I used there were but two plates, and the direction of the motions was of course the reverse of those with a battery of several pair of plates, and which are given above. Now I have been able experimentally to trace this motion into its various forms, as exhibited by Ampère's helices, &c.l and in all cases to show that dissimilar poles repel as wel as attract, and that similar poles attract as well as repel, and to make, I think, the analogy between the helice and common bar-magnet far stronger than before; but yet I am by no means decided that there are currents of electricity in the common magnet. I have no doubt that electricity puts the circles of the helice into the same state as those circles are in that may be conceived in the bar-magnet; but I am not certain that this state is directly dependent on the electricity, or that it cannot be produced by other agencies, and therefore, until the presence of electrical currents be proved in the magnet by other than magnetical effects, I shall remain in doubts about Ampère's theory."

Oct. 8th, he writes to J. Stodart, Esq.:—

"I hear every day more and more of those sounds, which, though only whispers to me, are, I suspect, spoken aloud amongst scientific men, and which, as they in part affect my honour and honesty, I am anxious to do away with, or at least to prove erroneous in those parts which are dishonourable to me. You know perfectly well what distress the very unexpected reception of my paper on Magnetism in public has caused me, and you will not therefore be surprised at my anxiety to get out of it, though I give trouble to you and others of my friends in doing so. If I understand aright, I am charged (1) with not acknowledging the information I received in assisting Sir H. Davy in his experiments on this subject; (2) with concealing the theory and views of Dr. Wollaston; (3) with taking the subject whilst Dr. Wollaston was at work on it; and (4) with dishonourably taking Dr. Wollaston's thoughts, and pursuing them without acknowledgment to the results I have brought out.

"There is something degrading about the whole of these charges; and were the last of them true, I feel that I should not remain on the terms I now stand at with you or any scientific person. Nor can I indeed bear to remain suspected of such a thing. My love for scientific reputation is not yet so high as to induce me to obtain it at the expense of honour, and my anxiety to clear away this stigma is such, that I do not hesitate to trouble you, even beyond what you may be willing to do for me."

He then proceeds to justify himself, and says, "The cause of my making the experiments detailed in my paper, was the writing of the historical Sketch of Electromagnetism that has appeared in the last two Numbers of the 'Annals of Philosophy.'"

On the 30th of October he writes directly to Dr. Wollaston, saying:—"I heard from two or three quarters that it was considered that I had not behaved honourably, and that the wrong I had done I had done to you; I immediately wished and endeavoured to see you, but was prevented by the advice of my friends, and am only now at liberty to pursue the plan I intended to have taken at first.

"If I have done any one wrong it was quite unintentional, and the charge of behaving dishonourably is not true. I am bold enough, sir, to beg the favour of a few minutes' conversation with you on this subject, simply for these reasons, that I can clear myself, that I owe obligations to you, that I respect you, that I am anxious to escape from unfounded impressions against me, and, if I have done any wrong, that I may apologise for it."

The following day Dr. Wollaston writes:—"You seem to me to labour under some misapprehension of the strength of my feelings upon the subject to which you allude. As to the opinions which others may have of your conduct, that is your concern, not mine; and if you fully acquit yourself of making any incorrect use of the suggestions of others, it seems to me that you have no occasion to trouble yourself much about the matter. But if you are desirous of any conversation with me, and could with convenience call to-morrow morning between ten and half-past ten, you will be sure to find me."

In a letter to M. G. De la Rive a fortnight later, he does not allude to the distress of mind he had gone through.

On Christmas Day he succeeded in making a wire through which a current of voltaic electricity was passing, obey the magnetic poles of the earth in the way it does the poles of a bar-magnet.

Mr. George Barnard, who was with him in the laboratory at the time, writes:—"All at once he exclaimed, 'Do you see, do you see, do you see, George!' as the small wire began to revolve. One end I recollect was in the cup of quicksilver, the other attached above to the centre. I shall never forget the enthusiasm expressed in his face, and the sparkling in his eyes!"

Æt. 30 (1822).

In 1822, a paper on the Alloys of Steel by Stodart and Faraday was read to the Royal Society, and printed in the Transactions. In the *Quarterly Journal of Science* he had two papers on the Changing of Vegetable Colours as an alkaline property, and on some bodies possessing it; and on the Action of Salts on Turmeric Paper.

The results of the paper on steel were of no practical value, and this, one of his first and most laborious investigations, is strikingly distinguished from all his other works by ending in nothing.

This year he began a fresh manuscript volume, which he called "Chemical Notes, Hints, Suggestions, and Objects of Pursuit." To it he transferred many of the queries out of his common-place book, but he separated his subjects under different heads. He puts as a sort of preface, "I already owe much to these notes, and think such a collection worth the making by every scientific man. I am sure none would think the trouble lost after a year's experience." When a query got answered, he drew a pen through it, and wrote the date of the answer across it. In this book are the first germs, in the fewest possible words, of his future work.

The last week in July he went with his friend Richard Phillips to Mr. Vivian's, near Swansea, to introduce a new process into the copper-works, and for a trial at Hereford, which was put off. At the end of a fortnight he returned to London.

His letters to Mrs. Faraday, who went to Ramsgate, are full of affection, and the account of his "escape from the large mansion and high company" on the Sunday, and other passages, show how strongly religious feeling was at work in him.

Æt. 31 (1823).

Two papers this year were read to the Royal Society, and printed in the Transactions—one on Fluid Chlorine, the other on the Condensation of several Gases into Liquids; and he had four papers in the *Quarterly Journal of Science*—one on Hydrate of Chlorine, one on the Change of Musket-balls in Shrapnell Shells, on the Action of Gunpowder on lead, on the purple tint of Plate-glass affected by Light. In a letter to Prof. G. De la Rive, March 24, he says:—"I have been at work lately, and obtained results which I hope you will approve of. I have been interrupted twice in the course of experiments by explosions, both in the course of eight days. One burnt my eyes, the other cut them, but I fortunately escaped with slight injury only in both cases, and am now nearly well. During the winter I took the opportunity of examining the hydrate of chlorine, and analyzing it; the results, which are not very important, will appear in the next number of the Quarterly Journal (over which I have no influence). Sir H. Davy, on seeing my paper, suggested to me to work with it under pressure, and see what would happen by heat, &c. Accordingly I enclosed it in a glass tube, hermetically sealed, heated it, obtained a change in the substance, and a separation into two different fluids; and upon further examination I found that the chlorine and water had separated from each other,

and the chlorine gas, not being able to escape, had condensed into the liquid form. To prove that it contained no water, I dried some chlorine gas, introduced it into a long tube, condensed it, and then cooled the tube, and again obtained fluid chlorine. Hence what is called chlorine gas is the vapour of a fluid. I have written a paper, which has been read to the Royal Society, and to which the President did me the honour to attach a note, pointing out the general application and importance of this mode of producing pressure with regard to the liquefaction of gases. He immediately formed liquid muriatic acid by a similar means, and pursuing the experiments at his request, I have since obtained sulphurous acid, carbonic acid, sulphuretted hydrogen, euchlorne, and nitrous oxide in the fluid state, quite free from water. Some of these require great pressure for this purpose, and I have had many explosions.

"I send you word of these results because I know your anxiety to hear of all that is new, but do not mention them publicly (or at least the latter ones, until you hear of them, either through the journals, or by another letter from me, or from other persons), because Sir Humphry Davy has promised the results in a paper to the Royal Society for me, and I know he wishes first to have them read there; after that they are at your service.

"I expect to be able to reduce many other gases to the liquid form, and promise myself the pleasure of writing you about them."

March 25, Monday, he writes to his friend Huxtable:—"I met with another explosion on Saturday evening, which has again laid up my eyes. It was from one of my tubes, and was so powerful as to drive the pieces of glass like pistol-shot through a window. However, I am getting better, and expect to see as well as ever in a few days. My eyes were filled with glass at first."

On May the 1st his certificate was read for the first time at the Royal Society:—

"Mr. Michael Faraday, a gentleman eminently conversant in chemical science, and author of several papers, which have been published in the Transactions of the Royal Society, being desirous of becoming a Fellow thereof, we, whose names are undersigned, do, of our personal knowledge, recommend him as highly deserving that honour, and likely to become a useful and valuable member."

Twenty-nine names follow; the first six were Wm. H. Wollaston, J. G. Children, Wm. Babington, Sir W. Herschel, J. South, Davies Gilbert. The certificate had to be read at ten successive meetings before the ballot came on.

On the 30th of May he wrote to H. Warburton, Esq.:—"Sir, I have been anxiously waiting the opportunity you promised me of a conversation with you, and from late circumstances am now still more desirous of it than at the time when I saw you in the Committee. I am sure you will not regret the opportunity you will afford for an explanation; for I do not believe there is anything you would ask *after you have communicated with me*, that I should not be glad to do. I am satisfied that many of the feelings you entertain on the subject in question would be materially altered by granting my request. At the same time, as I have more of your opinions by report than otherwise, I am perhaps not well aware of them. It was only lately that I knew you had any feeling at all on the subject. You would probably find yourself engaged in doing justice to one who cannot help but feel that he has been injured, though he trusts unintentionally. I feel satisfied you are not in possession of all the circumstances of the case, but I am also sure you will not wish willingly to remain ignorant of them. Excuse my earnestness and freedom on this subject, and consider for a moment how much I am interested in it."

At the foot of the copy of this letter Faraday made the following notes:—"In relation to Davy's opposition to my election at the R. S.: Sir H. Davy angry, May 30; Phillips's report through Mr. Children, June 5; Mr. Warburton called first time. June 5, evening; I called on Dr. Wollaston, and he not in town, June 9; I called on Dr. Wollaston and saw him, June 14; I called at Sir H. Davy's, and he called on me, June 17."

Many years ago he gave a friend the following facts, which were written down at the time: Sir H. Davy told him that he must take down his certificate. Faraday replied that he had not put it up; that he could not take it down as it was put up by his proposers. Sir Humphry then said, he must get his proposers to take it down. Faraday answered that he knew they would not do so. Then, said Sir H., I as President, will take it down. Faraday replied, that he was sure Sir Humphry Davy would do what he thought was for the good of the Society.

One of Faraday's proposers told him that Sir H. had walked for an hour round the courtyard of Somerset House, trying to convince Faraday's informant that Faraday ought not to be elected. However, the storm passed away, but not without leaving its effects; and on the 29th of June Sir H. Davy ends a note—"I am, dear Faraday, very sincerely, your well-wisher and friend."

July 8, Mr. Warburton wrote:—"I have read the article in the Royal Institution Journal, vol xv. p. 288, on Electro-magnetic Rotation, and without attempting to convey to you that I approve of it unreservedly, I beg to say that on the whole it satisfies me, as I think it will Dr. Wollaston's other friends. Having everywhere admitted and maintained that, on the score of scientific merit, you were entitled to a place in the Royal Society, I never cared to prevent your election, nor should I have taken any pains to form a party in private to oppose you. What I should have done would have been to take the opportunity, which the proposing to ballot for you would have afforded me, to make remarks in public on that part of your conduct to which I objected. Of this I made no secret, having intimated my intention to some of those from whom I knew you would hear of it, and to the President himself. When I meet with any of those in whose presence such conversation may have passed, I shall state that my objections to you as a Fellow are and ought to be withdrawn, and that I now wish to forward your election."

Aug. 29, Faraday writes to Mr. Warburton:—

"I thank you sincerely for your kindness in letting me know your opinion of the statement; though your approbation of it is not unreserved, yet it very far surpasses what I expected; and I rejoice that you do not now think me destitute of those moral feelings which you remarked to me were necessary in a Fellow of the Royal Society.

"Conscious of my own feelings and the rectitude of my intentions, I never hesitated in asserting my claims, or in pursuing that line of conduct which appeared to me to be right. I wrote the statement under this influence without any regard to the probable result; and I am glad that a step which I supposed would rather tend to aggravate feelings against me has, on the contrary, been the means of satisfying the minds of many, and of making them my friends. Two months ago I had made up my mind to be rejected by the Royal Society as a Fellow, notwithstanding the knowledge I had that many would do me justice; and in the then state of my mind rejection or reception would have been equally indifferent to me. Now that I have experienced so fully the kindness and liberality of Dr. Wollaston, which has been constant throughout the whole of this affair, and that I find an expression of goodwill strong and general towards me, I am delighted by the hope I have of being honoured by Fellowship with the Society; and I thank you sincerely for your promise of support in my election, because I know you would not give it unless you sincerely thought me a fit person to be admitted."

Faraday was the original Secretary of the Athenæum Club; but finding the occupation incompatible with his pursuits, resigned in May 1824. The original prospectus and early list of members have his name attached to them.

This year he was elected Corresponding Member of the Academy of Sciences, Paris, of the Accademia dei Georgofili di Firenze, Honorary Member of the Cambridge Philosophical Society and the British Institution.

(*To be continued.*)

The Birmingham Union Provident Sick Club, consisting of between three and four thousand members, have several times made the subjoined announcement by advertisement:—"The committee are desirous of appointing, as one of its medical staff, a gentleman engaged in the practice of homœopathy, and are prepared to receive applications for the same. The remuneration is 2s. 6d. per member per annum, divided half-yearly amongst the medical officers, in proportion to the number of members requiring their services."

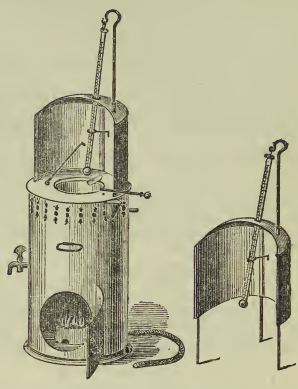
SCALLY'S PARAFFIN PROCESS FOR RENDERING CASKS IMPERVIOUS.

An important result, which has long been aimed at, seems to have been most satisfactorily accomplished by the process known under the above title. Although introduced to the various trades interested only within the past month or two, a long course of experiments has been instituted, for the purpose of fully testing the efficiency of paraffin in rendering casks, vats, and indeed wooden vessels of every description, thoroughly impervious to air and moisture.

The result of the investigation has been to establish fully the value of the process, which we have no doubt will shortly be generally adopted by brewers, wine-merchants, vinegar-makers, and others, while exporters, dealers, and consumers will all welcome a more perfect preservation of those liquids which are liable to fermentation, or become insipid by exposure to atmospheric influence. Many attempts have been made to secure these ends by means of soluble silicates, varnishes, etc., applied to the casks; but from many causes these have been at best but very partially successful. Paraffin as most of our readers are aware, is a substance much resembling spermaceti in appearance, and possesses every requisite to fit it for the purpose required, while it also seems to be entirely free from all properties which would interfere with its service in this respect. The experiments which have been made with this substance in the preservation of meat indicate its perfect power of preventing all contact of air, while its insolubility in water or spirit, its absence of taste and smell, and its freedom from all liability of cracking, give to paraffin a combination of advantages which can hardly be surpassed for the objects we now refer to. Paraffined casks, while retaining the safety and economy of wooden vessels, are in all respects of cleanliness and non-absorption equal to glass. They wear longer, are much more readily cleansed, and preserve their contents in better condition than casks not so treated, and thus effect a considerable saving to firms who make use of them. We regard the process as one of considerable practical utility, as well as generally interesting. Messrs. W. J. Coleman and Co., of St. Mary-at-Hill, are joint proprietors of the patent, and sole agents for working it.

PETROLEUM TESTING APPARATUS.

Considerable misconception prevails among dealers in petroleum as to the extent to which they are affected by the new Act. A careful reading of the statute will show that it is not necessary that any one selling petroleum or other mineral oils should be licensed by the local authorities at all, provided, always, that he be careful never to admit into his stock any oil or spirit which gives off an inflammable vapour at a temperature below 100° Fahrenheit; and no oil should be sold for ordinary burning purposes which could not safely emerge from the flashing test. The inspectors of weights and measures are, however, to have authority to examine any stock; and any person not licensed keeping oil for sale, which does not answer to the test proposed, will be liable to a penalty of £20 for every day it is so kept. The inspector's skill may, however, be appealed against, and the magistrates are then instructed to employ some one with sufficient chemical knowledge to examine and report upon the suspected oil; the fee for such examination to range between 2s. 6d. and 10s. 6d. Many of our readers will, no doubt, soon have the opportunity of receiving some of these fees, and all of them should be ready to undertake the examination of petroleum when occasion offers. We give an engraving of an apparatus which has



THE METROPOLITAN OIL TESTER.

met with the approval of the three inspectors connected with the Metropolitan Board of Works. It seems to answer every requirement of the Act, and, we imagine, will frequently be found useful to chemists for dispensing purposes, as it forms an elegant and compact water-bath. It is made of japanned tin, and the manufacturer has in two or three points improved upon the directions given by Government, as, for instance, in the provision of a tap and waste-tube for the part of the vessel which holds the water. The whole apparatus is very simple, and may be easily manipulated. It is called the "Metropolitan Oil Tester," from the fact of its having been selected by the inspectors we have named.

The maker, Mr. Miles, also manufactures another form of apparatus, one pattern of which is cheaper, and the other dearer, than the one we have engraved, which is sold for fifteen shillings.

Corner for Students.

CONDUCTED BY J. C. BROUGH, F.C.S.

The chemical notation employed in this section is based upon the new system of atomic weights, unless the use of the older system is specially indicated. In the *British Pharmacopœia* the symbolic formulæ corresponding to those adopted here are printed in heavy Clarendon type. The chemical nomenclature generally used in this Corner for Students agrees with that adopted in the new edition of *Fownes's Manual of Chemistry* which is recommended as a text-book. To secure uniform results students are requested to accept the atomic weights given in the last column of the *Pharmacopœia* table of elementary bodies.

QUESTIONS.

I. Liq. Bismuthi et Ammoniæ Citratis, *B.P.*—Explain the quantitative test, and show that it is consistent with the statement that one fluid drachm of the solution contains three grains of oxide of bismuth.

II. Morphiæ Acetas, *B.P.*—What is the weight of the product of the prescribed process, in grains?

III. Potassii Bromidum, *B.P.*—Explain, with the aid of symbolic equations, the reactions involved in the official process of preparing this compound.

IV. Antimonetted Hydrogen.—What is the black substance precipitated when antimonetted hydrogen is passed into a solution of silver nitrate?

V. Ammonia.—Represent symbolically the action of ammonia on aqueous solutions of the following substances:—

Hydrochloric acid, ferric chloride, sulphuric acid, calcium chloride, lead nitrate, and cupric chloride.

VI. Gases.—What is the theoretical specific gravity, referred to that of atmospheric air as unity, of each of the following gases:—Ammonia, marsh-gas, chlorine, carbon dioxide, and nitrogen monoxide. The specific gravity of hydrogen is to be taken as 0·069.

VII. Cyanogen.—What volume of air is required for the combustion of a litre of cyanogen? What is the volume of each product of the combustion? [In 100 vols. of air there are 20·81 vols. of oxygen.]

VIII. Silver Fulminate.—If a *gramme* of this compound were decomposed into carbon dioxide, nitrogen, and silver, what would be the volume of the mixed gases at 14·5° C. and 757 mm.?

IX. Potassium Chlorate.—When a few drops of strong sulphuric acid are added to a small quantity of potassium chlorate, a yellow gas having a powerful odour is liberated. Explain this reaction with the aid of an equation.

X. Specific Gravity.—The sp. gr. of zinc is 6·862. What is the weight of the water displaced by a piece which when immersed weighs 5·862 lbs.?

ANSWERS.

[*See Questions in January number, page* 121.]

I. Ferri Iodidum, *B.P.*—It is not entirely soluble owing to the presence of a little ferric oxide. Its solution rapidly absorbs oxygen from the air, with the formation of ferric oxide and the liberation of iodine, thus:

$$2\,FeI_2 + O_3 = Fe_2O_3 + I_4$$

This equation, however, does not fully express the decomposition of the iodide, as the ferric oxide is thrown down in combination with a variable proportion of water as a hydrate (the "rust-coloured sediment"), and a ferric oxychloride, which gives a red colour to the solution, is simultaneously formed. The blue precipitate obtained with the "red prussiate" consists of ferrous ferricyanide, $Fe_3\,(Fe\,Cy_6)_2$, better known as Turnbull's blue. The reaction may be thus expressed:

$$3\,FeI_2 + 2\,K_3FeCy_6 = Fe_3(FeCy_6)_2 + 6KI$$

On adding solution of chlorine to the solution of ferrous iodide mixed with mucilage of starch, the chlorine displaces the iodine which thus becomes free to form with the starch the characteristic blue compound.

II. Sodæ Arsenias, *B.P.*—According to the symbolic formula the percentage of arsenic in the crystallised salt is 24·038.

III. Indirect Analysis.—The mixture contains 11·7 grains of sodium chloride.

As Cl = 35·5, and as KCl = 74·5, if all the chlorine present (42·6 grains) were combined with potassium the weight of the chloride would be 89·4 grains, for

$$35·5 : 42·6 = 74·5 : 89·4$$

But as the mixture weighs only 86·2 grains, sodium chloride is present in a quantity proportional to the difference, 89·4 — 86·2 = 3·2. Now the difference between the molecular weights of KCl and NaCl is 74·5 — 58·5 = 16, and this is to the molecular weight of NaCl, as the difference found is to the quantity of sodium chloride present in the mixture:

$$16 : 58·5 = 3·2 : x\,;\ \therefore\ x = 11·7$$

The correctness of this result may be demonstrated thus:

Grs.		Grs.	
11·7	sodium chloride represent	7·1	chlorine
74·5	potassium „ „	35·5	„
86·2	mixed chlorides „	42·6	„

IV. Ammonia.—By the action of heat the gas is decomposed, thus

$$\underset{\text{4 vols.}}{2NH_3} = \underbrace{N_2 + H_6}_{\text{8 vols.}}$$

On exploding the resulting gaseous mixture with half its bulk of oxygen, three-fourths of the oxygen unite with the hydrogen to form water, the remaining one-fourth being left with the nitrogen uncombined, thus

$$\underbrace{N_2 + H_6}_{\text{8 vols.}} + \underbrace{O_4}_{\text{4 vols.}} = \underbrace{N_2 + O}_{\text{3 vols.}} + H_2O$$

V. Sulphuretted Hydrogen.—The weight of antimony trisulphide required for the production of 20 litres of this gas at 13·6° C. and 754 mm. is 95·713 *grammes*.

The reaction may be thus expressed

$$Sb_2S_3 + 6HCl = 3H_2S + 2SbCl_3$$

From this equation we learn that 340 *grammes* of the antimony trisulphide ($Sb_2S_3 = 340$) would be required for the production of 22·38 × 3 = 67·14 litres of the gas at the standard temperature and pressure. The corresponding volume at 13·6° C., but still at the standard pressure, may be found thus.

$$273 : 273 + 13·6 = 67·14 : x\,;\ \therefore\ x = 70·485 \text{ litres}$$

This volume is thus corrected for the pressure of 754 mm.

$$754 : 760 = 70·485 : x\,;\ \therefore\ x = 71·046 \text{ litres.}$$

As this volume is the yield of 340 *grammes* of antimony trisulphide the quantity of the latter required to produce 20 litres at the same temperature and pressure is found thus,

$$71·046 : 20 = 340 : x\,;\ \therefore\ x = 95·713 \textit{ grammes.}$$

VI. Ferric Oxide.—The weight of water produced by the decomposition of 35·783 grains of ferric oxide by hydrogen would be 12·077 grains.

According to the equation

$$Fe_2O_3 + H_6 = Fe_2 + 3H_2O$$

the weight of water produced in this way with 160 grains of ferric oxide ($Fe_2O_3 = 160$) is 54 grains, hence

$$160 : 35·783 = 54 : 12·077$$

VII. Action of Acids on Copper.—The action of nitrogen on copper is attended with the production of cupric nitrate and the evolution of nitrogen dioxide, thus

$$8HNO_3 + Cu_3 = 3Cu(NO_3)_2 + 4H_2O + N_2O_2$$

The action of heated sulphuric acid on copper is attended by the production of cupric sulphate and the evolution of sulphur dioxide, thus

$$2H_2SO_4 + Cu = CuSO_4 + 2H_2O + SO_2$$

VIII. Arsenetted Hydrogen.—The substance precipitated is *pure metallic silver*. The arsenic and a portion of the silver become oxidised and form the arsenate, $Ag_4As_2O_5$, which remains dissolved in the liberated nitric acid, thus

$$2AsH_3 + 16AgNO_3 + 5H_2O = Ag_{12} + Ag_4As_2O_5 + 16HNO_3$$

IX. Specific Gravity.—According to the data the sp. gr. of the solid is ·977.

The difference, 1187 — 1100 = 87, represents the weight of benzol displaced by the solid weighing 100 grains, therefore 100 ÷ 87 = 1·149 the sp. gr. of the solid compared with benzol; but as the sp. gr. of benzol is ·85 the true sp. gr. of the solid is 1·149 × ·85 = ·977.

X. Combustion of Carbon.—The percentage composition of the gaseous mixture, is nitrogen 79·000, oxygen 19·437, carbon dioxide 1·563.

The room originally contained 10·5 cubic metres of oxygen and 39·5 cubic metres of nitrogen. Now by the equation

$$C + O_2 = CO_2$$

we see that the combustion of 12 *grammes* of carbon would convert ·02238 cubic metres (= 22·38 litres) of oxygen at 0° C. into the same volume of carbon dioxide. Now the corresponding volume at 13° C. is ·02345 cubic metres, for

$$273 : 273 + 13 = ·02238 : ·02345$$

The volume of oxygen converted into carbon dioxide by the combustion of 400 *grammes* of carbon is therefore ·78167 cubic metres, for

$$12 : 400 = 0·2345 : ·78167$$

The difference between this volume and the original volume of the oxygen, necessarily represents the volume of the residual oxygen; therefore the room contains 39·5 cubic metres of nitrogen, 9·7183 of oxygen, and 0·7817 of carbon dioxide. As the capacity of the chamber is 50 cubic metres these numbers doubled are the required percentages.

PRIZES.

The First Prize for the Solutions of Problems in our February number is awarded to

RICHARD J. MOSS, 16, Leinster-sq., Rathmines, Dublin,

who obtained one of our earliest prizes.

The Second Prize is awarded to

A. J. PEPPER, Barrowden, Rutland.

Messrs. Gregory and Kendall press close upon the prize-winners in the list of marks.

Marks awarded for Prizes.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	E.	Tot
J. Moss (*1st prize*)	8	3	10	6	8	6	7	7	2	9	6	72
J. Pepper (*2nd prize*)	6	3	10	6	8	6	7	7	3	9	5	70
J. Gregory ..	7	3	10	5	8	6	7	6	3	9	5	69
J. A. Kendall ..	6	2	10	6	8	6	7	8	0	9	6	69
J. C. Thresh ..	7	3	10	6	6	6	7	7	3	9	4	68
Junr. Apprentice.	7	3	8	2	8	6	7	7	3	9	5	65
W. P. S. ..	7	3	10	6	8	6	7	7	3	0	5	62
J. Welborn ..	8	3	0	6	8	6	7	7	3	9	5	62
C. T. ..	7	3	8	6	0	6	7	7	3	9	5	61
J. W. Evans ..	8	3	0	6	5	6	7	7	3	9	5	59
Solus ..	5	3	9	6	6	6	7	0	3	9	4	58
A. Fraser ..	7	3	0	5	7	6	7	7	3	9	3	57
J. W. ..	6	2	—	6	8	6	7	6	3	9	4	57
A. E. I. ..	7	3	0	6	6	6	7	0	3	7	4	49
J. D. D. Thomas.	7	3	0	6	8	6	7	4	3	0	5	49
Tyro ..	7	3	—	6	4	7	7	0	3	9	4	49
T. Habgood ..	7	3	0	5	8	0	4	0	3	9	5	44
J. Tully ..	7	3	0	0	8	6	7	7	3	0	3	44
X. Y. P. ..	6	3	0	4	6	6	4	0	3	0	3	35
W. B. J. ..	6	3	0	3	4	6	3	0	3	0	0	28
W. J. Smith ..	7	3	0	6	0	6	0	0	3	0	0	25
W. B. Baron ..	5	3	—	5	—	0	7	0	0	—	0	18
W. Lucas ..	—	3	—	—	—	6	—	—	3	0	0	12

TO CORRESPONDENTS.

* All questions forwarded to us for publication in this "Corner for Students" should be accompanied by the answers which the propounders believe to be correct. As a rule, numerical results should be worked out to three decimal places, due allowance being made for large remainders. Communications should reach us at least *ten days* before the date of publication, and include the names and addresses of the writers.

POSTAGE, LATE COMMUNICATIONS.—We frequently have to pay extra postage for manuscripts over weight. Many communications reached us this month after the 4th, and their late arrival has given us much trouble. In future, we shall strictly adhere to our rule of disregarding those papers that are not sent to us in good time.

R. J. Moss.—We are indebted to you for the wording of some of our printed solutions

T. T.—III. Your solution of this problem does not indicate a general mode of determining the composition of mixtures.

W. B. B.—The new edition of Bentley's "Botany" will be published next month.

Books offered as First Prizes.

Attfield's *Introduction to Pharmaceutical Chemistry.* (Van Voorst.)
Conington's *Handbook of Chemical Analysis;* with Tables of Qualitative Analysis adapted to the same. (Longmans.)
Eliot and Storer's *Manual of Inorganic Chemistry.* (Van Voorst.)
Fownes's *Manual of Elementary Chemistry, Theoretical and Practical* (Churchill.)
Ganot and Atkinson's *Elementary Treatise on Physics.* (Longmans.)
Garrod's *Materia Medica;* with Modern Chemical Notation. (Walton.)
Noad's *Chemical Analysis, Qualitative* and *Quantitative.* (Reeve.)
Northcote and Church's *Qualitative Analysis.* (Van Voorst.)
Royle and Headland's *Materia Medica.* (Churchill.)
Wilhamson's *Chemistry for Students.* (Clarendon Press.)
[Any other scientific book that is published at a price not greatly exceeding half-a-guinea may be taken as a first prize.]

Books offered as Second Prizes.

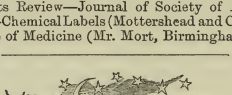
Church's *Laboratory Guide for Students in Agricultural Chemistry.* (Van Voorst.)
Galloway's *First Step in Chemistry.* (Churchill.)
Hofmann's *Introduction to Modern Chemistry.* (Walton.)
Oliver's *Lessons in Elementary Botany.* (Macmillan.)
Potts's *Elements of Euclid.* School Edition. (Longmans.)
Roscoe's *Lessons in Elementary Chemistry.* (Macmillan.)
Wurtz's *Introduction to Chemical Philosophy.* Reprinted from the "Chemical News."
[Any other scientific book which is sold for about five shillings may be taken as a second prize.]

CHEMICAL LABELS.

LAST month we animadverted on a Book of Chemical Labels, published by Messrs. Mawson and Swan, of Newcastle-on-Tyne, and called attention to many errors and inconsistencies in the names and formulæ given in the labels. We are glad to be able to inform our readers that the publishers on reading our review at once made arrangements for the preparation of an amended edition. The second edition, which will be ready shortly, is really an entirely new work. It will comprise 224 separate labels, with a table of atomic weights, and an explanatory introduction, which will exhibit the names and formulæ adopted by modern chemists, together with those formerly employed. The new editions of Fresenius's *Analysis* and Fownes's *Chemistry* have been consulted by the compiler. The labels will be beautifully printed and gummed ready for use. Our attention has been called to a small set of labels, issued some time ago by Messrs. Mottershead and Co., of Manchester, giving the nomenclature and notation used in Roscoe's *Elementary Chemistry.* These labels are printed on two sheets, and as far as they go they are quite satisfactory.

PUBLICATIONS RECEIVED.

We have received the following books, periodicals, etc.:—Scientific American (New York)—Trade Review (Montreal)—Druggist Price Current (New York)—Dental Cosmos (New York)—Journal of Materia Medica (New York)—Pacific Medical and Surgical Journal (San Francisco)—Canada Medical Journal (Montreal)—Commercial Herald (San Francisco)—British Medical Journal—Pharmaceutical Journal—Monthly Homœopathic Review—Grocer—Stationer—Produce Markets Review—Journal of Society of Arts—A B C Advertiser—Chemical Labels (Mottershead and Co.)—Science and Practice of Medicine (Mr. Mort, Birmingham).



HOUSE OF COMMONS.

FALSE WEIGHTS AND MEASURES AND ADULTERATION.

ON Friday, the 5th inst., before going into Committee of Supply,

Lord E. CECIL rose to call attention to the state of the law with respect to false weights and measures, and the adulteration of food, drink, and drugs. According to a return which he had moved for last Session, there were no less than 659 convictions for the use of fraudulent weights and measures between the 1st of July, 1867, and the 1st of January, 1868, in the metropolitan area, exclusive of six districts which had not furnished statistics. He referred to the defects of the present system of inspection, and declared that hundreds and thousands of the poorer classes were suffering because there was no effective legislation on the subject of false weights and measures. Turning to that portion of his motion which related to the adulteration of food and drink, he said it was not necessary for him to appeal to medical gentlemen, in or out of that House, to prove that purity of food was of vital importance, whether to the child in its cradle, to the boy at school, or the workman who had to earn his bread by the sweat of his brow. Those were simple truisms with which anybody who thought of the matter for two moments would not hesitate to agree. The purity of drink was also of the greatest importance to the poor, because many of the vices and crimes common to that class were connected with it. Take, for instance, the case of the soldier and the sailor when brought to the bar of a court-martial, and ask them what it was that first got them into trouble. Their answer would be that it was some nasty stuff they drank at a publichouse. Or go into any of the streets of our large towns, and ask some of those wretched women—the disgrace of our civilization—who were to be found there, and they would tell them that much of their wretchedness was due, in the first instance, to drink. Well, what, under those circumstances, had the Legislature done in that matter? As far as he could make out, it had simply punished the crime of adulterating food by a trumpery fine, quite disproportionate either to the offence or the wrongful gains of the delinquent. And here he would briefly examine the state of the law. Passing by the 9th Queen Anne, the 17th and 56th George III., the 3d

George IV., the 1st, 6th, and 7th William IV.—Acts all relating more or less to the adulteration of beer, tea, and bread—the first comprehensive Act which dealt with the subject thoroughly was the 23d and 24th Victoria, which was passed mainly through the efforts of Mr. Scholefield; and he ventured to say, in no disrespectful spirit to that gentleman's memory, that that Act was a mockery and a delusion, and had entirely failed in its object. Many of them would recollect that a committee sat in 1855-6 to inquire into that question. A number of witnesses of the highest scientific acquirements were examined, the public attention was generally drawn to the matter, and the result was—he was sorry to be obliged to call it so—one of the most ridiculous measures that ever became law. After reciting that the sale of adulterated articles of food and drink, being hurtful to health, ought to be repressed by more effectual legislation, it enacted that the person selling such articles, knowing them to be injurious to health, should be subject to a penalty not exceeding £5 and costs; so that any tradesman might, as far as that clause was concerned, knowingly ruin his neighbour's health on paying £5 and costs. Then, for a second offence, if he had probably poisoned scores of people, and ruined the health of scores of others, the justices had power—to do what? To imprison him, or send him to the assizes? Not a bit of it; but to publish his name, residence, and offence in any way they thought desirable at his own expense. Thirdly, the Act gave a power—which he believed never had been put in force—to appoint analysts, but not a word was said about the payment of them. Fourthly, it provided a protection, forsooth, against articles of food being tampered with by purchasers. Fifthly, there was a power for the purchaser and the justices to have food analysed; and he supposed the purchaser was to test the food at his own expense. And lastly, it was provided that that precious Act was not to apply to medical drugs or articles usually taken or sold as medicine. So that it came to this, that their baker who adulterated a loaf of bread with a certain quantity of alum was, if convicted, to be punished with a fine of £5 and costs; but their chemist, who had to supply them with the necessary medicine to get rid of that alum, escaped with perfect impunity. There was not a word in that Act about the appointment of really good inspectors or supervisors, which he thought a most important point; and he should be very glad to see in any measure brought in on that subject, that an efficient body of such officers was to be appointed, so that any penalties which might be enacted by law would be really enforced. Perhaps some might think he took rather an exaggerated view of the present state of adulteration as far as food and drink were concerned; but let such persons, if there were any, read some of the evidence given before the Select Committee to which he had referred; and if they thought that commercial morality was superior now to what it was in 1856 and 1857 he would humbly request them to look at the too frequent cases which appeared in the papers of fraud, both in high and in low quarters. But if they wanted some modern testimony as to that point, he would refer them to the very able report drawn up by the chemical officer of the Board of Revenue, Mr. George Phillips; and if they were still dissatisfied he would suggest to them that they should go to the first publichouse in town, or out of it, and ask for a glass of beer. He would not trouble the House with a long list of all the disagreeable things which they had to swallow, nor with details of the exact quantity of alum, or red lead, or vitriol, or any other of the pleasant compounds which had been known to enter into their daily food. It was sufficient for him that it had been shown, on indisputable evidence, that those days did exist. It was said that a man must swallow at least a peck of dirt in his lifetime, but he suspected that many of them had to swallow a great deal more. He might mention what occurred not very long ago in the Committee on the Malt-tax, of which he was a member. Every agricultural witness examined before that committee testified to the fact that the beer sold in publichouses was adulterated. Now, in speaking of the adulteration of beer, he did not for one moment bring a charge against the great brewers. He believed that the evidence cleared them entirely from all suspicion of adulteration, but this could not be said of the publichouse. Not only did the gentleman to whom he had alluded speak in an undoubted manner of the way in which beer was adulterated, but there was one practical witness who asserted from his own daily knowledge that such was the fact. The only labourer who was examined gave his evidence in these terms. He was asked, "Can a man do hard work on publican's beer?" and his reply was "No." "What effect has it?" he was next asked, and he answered, "The beer is so bad that he cannot work." "It gets into his head?" Answer, "Yes." "It makes him feel so bad?" Answer, "Yes; it makes a man feel too bad to do hard work. He always wants to be drinking." Now, there was one fact which established beyond doubt that this man's evidence was truthful,—viz., the fact that the importation of Coculus Indicus had largely increased within the last few years. Coculus Indicus was a narcotic of an intoxicating and stupefying character, and, as far as he was aware, was only used in this country for two purposes, the poisoning of fish and the poisoning of men. He found that in 1857 the quantity of the drug consumed in this country was only 68 cwt., but in 1858 it had increased to 394 cwt.; while in the years 1867 and 1868 the quantities consumed were respectively 689 cwt. and and 1,064 cwt. The drug was thus extensively used, notwithstanding the fact that the very heavy duty of 5s. per cwt. was levied upon it. No wonder, then, that the statement made by the poor man before the Committee was perfectly true with regard to many labourers in the country. No wonder he complained that he could not do his work and that he always wanted to be drinking. We often heard of labourers being knocked down with sunstroke during the hot season, but we ought not to be greatly surprised at this if we remember that an enormous quantity of Coculus Indicus was imported into this country, and that this subtle poison entered into their daily drink. Then there was another article which he believed was very considerably adulterated, and it was one which our seafaring population were especially interested in obtaining in a pure state. It was only the other day that he read a newspaper paragraph which stated that in Liverpool it was quite impossible to procure limejuice of sufficient purity to meet the requirements of the Board of Trade. Of course, he could not vouch for the truth of the statement, but if it were true such a fact certainly did not tell well for our commercial morality. He thought he had sufficiently proved that the law required amendment of some sort. In his opinion a penalty of £5 and costs was much too insignificant to prevent the recurrence of this class of offences, and the law was likewise defective, because it did not provide for a proper supervision and inspection with regard to weights and measures and the adulteration of food. Should a bill on this subject be introduced, it would be well to consider what was the practice in foreign countries with respect to these matters. He found that in almost every civilized country the provisions of the law were far more stringent than with us. In France, for example, all frauds of this kind were looked after by the police. A commissary of police had a right to enter premises and seize any suspected goods he might find, bearing all the responsibility, of course, if the seizure were a wrongful one. Then the inspectors, both of weights and measures of food, were not, as with us, retired tradesmen, but were appointed by a central authority—the Minister and Prefect. With regard to drugs, there was a special body, called Inspecteurs de Pharmacies, and the tribunals had the power to punish offenders with fine and imprisonment, to advertise the names of delinquents, and to order the adulterated goods either to be destroyed before the owner's doors, or to be confiscated for charitable purposes. The law of Prussia was still more stringent. Whoever knowingly used false weights and measures in that country was liable to imprisonment for three months, to be fined from 50 to 1,000 thalers, and to suffer the temporary loss of his rights of citizenship. Secondly, where false weights and measures were not regularly employed, a fine of 30 thalers may be imposed, or the delinquent sent to prison for four weeks. Thirdly, the adulteration of food or drink is punishable with a fine of 150 thalers, or six weeks' imprisonment. Fourthly, if poisonous matter or stuff be employed the offender is liable to imprisonment for a term not exceeding ten years. Fifthly, where adulteration was proved to have caused severe physical injury a sentence of from ten to twenty years' imprisonment might be passed. And yet in this country offences of this nature could only be punished by the imposition of a penalty of £5, with costs. It might,

however, be asked why he, who had gone so deeply into this subject, and had pointed out the defects of the existing law did not try his hand at amending it in the best way he could. His reply was that questions of this kind could be much better dealt with by Government. For his own part, he was very much opposed, as a rule, to a private member bringing in a measure on a subject of a national character. Now, this subject was one which, in his judgment, ought to have been looked into, and legislated upon long ago. He had hoped that the late Government would have taken it up, but they had too much of other work on their hands. Besides, they had not the power, if they had the will to do justice to it, on account of the powerful opposition arrayed against them. He might, indeed, say that that the late Government only existed on sufferance. This, however, was far from being the case with the Government now in office, who, being backed up by a majority of over 100, had the power, and if report spoke truly, the will also, to deal with this question in a satisfactory manner. He sincerely trusted, however, that the Government would not appoint either a committee or a Royal Commission to investigate the subject, for in nine cases out of ten the labours of commissions and committees led to the shelving of the questions which they were appointed to consider. Of information regarding this matter, and, he might add, of delay also, the country had quite enough. What was required was action, and immediate action; and the minister who should deal with the subject quickly, thoroughly, and comprehensively would entitle himself to the gratitude of the whole community, and would go down to posterity as one of the greatest benefactors to the labouring classes. In conclusion the noble lord moved—"That in the opinion of this house it is expedient that her Majesty's Government should give their earliest attention to the widespread and most reprehensible practices of using false weights and measures, and of adulterating food, drink, and drugs, with the view of amending the law as regards the penalties now inflicted for these offences, and of providing more efficient means for the discovery and prevention of fraud."

Mr. POLLARD-URQUHART remarked that adulteration arose principally from a desire to sell articles at a low price, and the easiest way of checking it was to reduce the Customs and Excise duties.

Mr. POCHIN thought the noble lord had done good service by directing the attention of the House to the subject. Adulteration might be divided into two classes, that which tended to reduce the commercial value of the article sold to the public, and that which was calculated to interfere prejudicially with the general health of the community. Under the first head he was of opinion that a very large amount of adulteration existed, but he doubted very much whether the statement of the noble lord was correct so far as adulteration affecting the general health of the people was concerned. His own impression was—and it was the result of much careful investigation of the subject—that the articles of food which were adulterated in such a manner as to affect to any material degree the public health were exceedingly restricted in number, and a thorough examination of the evidence which had been taken on the point would, he ventured to say, establish the soundness of that view. The greatest service which had been done the country in connection with the subject was that which had been rendered by the analytical commission which prosecuted its labours some fourteen or fifteen years ago, under the able direction of Dr. Hassall, the result of whose investigations had been published in the *Lancet*. The result of the inquiry went to prove that while the articles which were adulterated were very numerous—there being scarcely any article of commerce which was not adulterated—yet that adulteration tending to injure the health of the community was extremely limited. He believed, indeed, he was right in saying that the list of articles which had been found to be adulterated to an extent deeply injurious to health was pretty nearly confined to pickles, sweetmeats, and Cayenne pepper. It had indeed been discovered that there was scarcely a single sample of arrowroot which was not extensively adulterated; but then it was with an inferior substance, injurious rather to the pocket than to the health of the consumer. He had another reason for believing that the conclusions at which he had arrived in the matter were correct. Soon after the passing of the 23d and 24th Victoria, the Act was taken into consideration by a very energetic committee, who conducted its labours in Manchester, called the Sanitary Association, and whose members were of opinion that adulteration injurious to health very largely prevailed. They accordingly persuaded six of the most eminent chemists in Manchester to collect articles from all parts of the town and to report upon them. He held in his hand the report which was drawn up as the result of that investigation, by Dr. Angus Smith, who, he understood, held some official position under the Government, and than whom a more able man as the head of such an inquiry could not be found. The conclusion arrived at by the committee was that out of eighty substances which had been procured from shops in which the labouring classes dealt extensively, none were adulterated in a way deeply to affect the public health, and he was happy to be able to add that the evil of adulteration instead of being constantly on the increase, was rather shown to be diminishing, by the evidence furnished by recent investigations. He did not, however, mean to contend that the question was not one in which the Government might very well take action. Nothing was more objectionable than that there should be any mistake with respect to it out of doors, and he could very well imagine that if the statement of the noble lord were to go forth to the public unquestioned that articles of food and drink were so adulterated as to be deeply injurious to health, the shock to the nervous system of a large portion of the community would be far more prejudicial than any actual amount of adulteration which might exist. What the House wanted were the real facts of the case, and the Government had it in their power to supply these at a comparatively small outlay. He agreed with the noble lord that it would be useless to appoint a committee or a Commission before which anybody who had a bee in his bonnet on this subject might exhibit the bee, as had been done in the case of the last committee. The proper course was to place the matter in the hands of some one or two official analysis, associated with a microscopist, and they would give to the country the exact state of the case. Parliament would then legislate with much greater certainty and confidence than it could at present. Two kinds of adulteration had been specially named—the mixing of alum in bread and Coculus Indicus in beer. Now he was not going to dispute the poisonous nature of Coculus Indicus, but no one had yet shown that the injurious effects produced on the system by intoxication were not quite as little injurious when resulting from Coculus Indicus as from spirit. As to the presence of alum in bread, the general opinion on this point was quite at variance with that of the most able chemists. Professor Liebig had acknowledged that the ordinary mixture of alum in bread as practised in this country was not injurious but positively beneficial. Hon. members laughed, and he should like to convince them by going into the question somewhat technically. In general terms, however, he might say that flour contained a great quantity of gluten, which very readily passed into a state of decomposition and decay. The presence of a small quantity of alum arrested that decay, and enabled the baker to produce by the use of seconds flour a very much superior bread than would otherwise be possible. The substitute which Liebig recommended the baker to use in such cases was caustic lime. Hon. members might take their choice between the addition of alum and caustic lime; for his part he preferred the alum, and that would be the general opinion. He had said that the health of the community was not extensively interfered with by adulteration; but adulteration was practised so as to amount to a fraud upon the community. It was, therefore, rather on the ground of injury to the pocket than of injury to health that he joined the noble lord in urging the Government to give their immediate attention to this very important subject.

Mr. BRIGHT: The noble lord has taken great pains upon this question, and has brought before the House a great amount of detail in connexion with it. As I listened to his observations I hoped and believe there was, though it was entirely unintentional, no little exaggeration in them. Although there may be particular cases in which great harm to health and great fraud may possibly be shown, yet I think that general statements of this kind, implicating to a large extent the traders of this country, are dangerous

and are almost certain to be unjust. Now, my hon. hon. friend (Mr. Pochin) who has just addressed the House in a speech showing his entire mastery of the question, has confirmed my opinion, for he has shown—and I dare say he knows as much of the matter as any gentleman present—that there is a great deal of exaggeration in the opinions which have prevailed in many parts of the country, and which have ever been found to prevail upon the matter in this House. The proposition of the noble lord is,—"That it is expedient that Her Majesty's Government should give their earliest attention to the widespread and most reprehensible practices of using false weights and measures and of adulterating food, drink, and drugs," and so on. Now, I om prepared to shew that the exaggeration of the noble lord—I do not say intentionally, of course; I am sure he is incapable of that—is just as great in the matter of weights and measures as in that of adulteration. Probably he is not aware that in the list of persons employing weights that are inaccurate—I do not say fraudulent—no distinction is drawn between those who are intentionally fraudulent and those who are accidentally inaccurate and that the penalty is precisely the same, and the offence is just as eagerly detected, whether there be a fraud or merely an accident. Now the noble lord will probably be surprised when I tell him that many persons are fined annually, not because their weights are to small, but because they are too large. In fact, when the weights are inaccurate but in favour of the customer, still the owner and user of the weight is liable to the penalty and is fined. I have here a statement made by the Secretary of the Standards Commission, to which this matter has been referred, and he says:—"During recent years many returns have been laid before Parliament of convictions for false and unjust weights and measures, more especially in the metropolitan district, and a close examination of these returns will show very few convictions for fraudulent weights and measures. The great majority are for defective or unjust weights and measures, deviating more or less from the standard, many of these deviations being of comparatively trifling amount, and frequently in favour of the purchaser—that is to say, the weights are too heavy and the measures too large. The convictions for unjust balances are also, for the most part, for defective not for fraudulent balances." That is a statement coming from undoubted authority, which may relieve our countrymen connected with trade from the stigma attaching to them that there exists a general or widespread system of using inaccurate and fraudulent balances. An Act on this subject was passed in 1835, and penalties were inflicted, as I have said. The noble lord is against any more commissions or committees, and I do not ask for them for a moment, but a commission is now engaged in inquiring into this very subject. It was appointed with a view to the revison of the standards, because, while fining shopkeepers for the use of inaccurate weights, it was found in a great many cases that the standards themselves were inaccurate, and for a tradesman to be fined because he did not keep his weight by an inaccurate standard seems to be rather a stretch of power. (Hear, hear.) This commission is now sitting; they have extended their inquiry to this very Act to which the noble lord alluded. In four or five months their report will be made, and there is an expression of opinion on the part of the secretary that the whole of the laws connected with weights and measures appear to require revision, and that a comprehensive measure is required for amending and consolidating those laws. The report of the commission will not be issued for some time, and as Parliament has on its hands, probably, quite as much as it can do in the present Session, I do not think that any legislation will be possible this year. Now I come to the question of adulteration. My late lamented friend and colleague, Mr. Scholefield, brought in a bill in 1860 or 1861. He was much urged to do this by very enthusiastic constituents of his who took a prodigious interest in the matter. I have not the Act before me, and I do not know exactly how far its provisions extend; but it gave corporations and magistrates power to appoint analysts who should take care to examine into adulterations, and penalties were to be inflicted under the Act. If the corporations and magistrates have not sufficient interest in the matter, if the people who elect the corporations care so little about it, I think that is fair evidence that the grievance is not near so extensive and injurious and burdensome as it has been described by the noble lord. My own impression with regard to this adulteration is that it arises from the very great, and, perhaps, inevitable competition in business; and that, to a large extent, it is promoted by the ignorance of customers. As the ignorance of customers generally is diminishing, we may hope that before long the adulteration of food may also diminish. The noble lord appears to ask that something much more extensive and stringent should be done by Parliament. The fact is, it is vain to attempt by the power of Parliament to penetrate into, and to track out evils such as these, on which the noble lord has dwelt at such length. It is quite impossible that you should have the oversight of the shops of the country by inspectors and that you should have persons going into shops to buy sugar, pickles, and Cayenne pepper, to get them analysed, and then to raise complaints against shopkeepers, and bring them before the magistrates. If men in their private businesses were to be tracked by Government officers and inspectors every hour of the day, life would not be worth having, and I should recommend them to remove to another country, where they would not be subject to such annoyance. The question, too, as the noble lord has put it, is one of great difficulty, because, if the Government proposed to legislate on the whole of this matter, I suspect it would be found that, in the clauses of a Bill, however carefully it might be drawn, there would be points that would create so much difference that it would be impossible to settle them. It was the case, I know, when my late colleague brought forward his Bill, and it was found almost impossible to pass it through the House. If any hon. member chooses to go into this question before the Government can touch it, and to suggest a measure which he may think will be likely to give satifaction, the Government will be perfectly ready to examine it, and give it fair consideration. I regard these subjects as about the most difficult, and, at the same time, I think, about the least advantageous to which Parliament can devote itself. Most of the Bills of this kind which have been passed during the twenty-five years I have been in Parliament have failed in their operation, and I suspect that most of the attempts which will be made hereafter will be equally unsuccessful. The question of weights and measures is a different one; it is simple; you can reduce it to an accurate standard, and Parliament can accomplish something. The report of the Commission will soon be made; and it is, I believe, the intention of the Government, as it would be my own disposition, when it is made, to take such steps as may appear best, with a view to asking Parliament for fresh legislation on this subject. I shall be glad if, after this answer and explanation, the noble lord may not deem it necessary to press the motion which he has placed on the notice paper.

Mr. BENTINCK commented with some warmth on the unsatisfactory tone of Mr. Bright's answer, and recommended him to study the laws of foreign countries on this matter.

Mr. PEEK, speaking as one who had been engaged during the last thirty years in selling articles for the breakfast table, had no hesitation in saying that although 100 tons of tea were annually sold throughout the country not a single pound was adulterated. Still, a great deal of adulteration, no doubt, went on, but the motive was extra profit; very few of the adulterating materials were injurious. With regard to the punishment of persons using false weights and measures, he believed it would be most unwise to increase the penalties, as he had been assured by the clerks to the magistrates of Middlesex and of Surrey that in most cases the inaccuracy arose from carelessness rather than design.

The motion was withdrawn.

NOTTINGHAMSHIRE CHEMISTS' ASSOCIATION.

THE inaugural meeting of the Nottingham and Nottinghamshire Chemists' Association was held at the Exchange Rooms, Nottingham, on the 12th ult. Mr. T. H. ATHERTON, F.C.S. (president), occupied the chair. Mr. FITZHUGH (honorary secretary) read the minutes of a previous meeting at which the society was established.

The PRESIDENT then delivered his inaugural address.

After thanking the members and associates for electing him their first president, he briefly referred to the cause they were to further, viz., local organization and educational improvement. He congratulated the meeting on the advent of the Pharmacy Act, the passing of which seemed to have aroused the slumbering energies of chemists throughout the country, and which would no doubt result in the formation of educational societies of a similar nature in most large towns. An attempt had been made before in Nottingham, but it had failed. Their position now was much improved however, and their responsibilities had increased. They were now a professional body, having to go through a prescribed course of study, and to pass certain examinations before commencing the practice of pharmacy. Upon the present race of chemists devolved the training of the future pharmaceutists. It was the duty of all to improve themselves, and endeavour to elevate those with whom they were associated in the laboratory and the shop. But how was this to be done? Few were in a position to afford the requisite instruction themselves, and very few had such books from which the student could obtain the requisite information. This could not be done singlehanded. The best means of obtaining these advantages was local organisation, and the formation of societies like this by whose auspices lectures would be established for their young men—on chemistry, pharmacy, botany, and materia medica, and by whose aid it was hoped to establish a reading-room and library; also, a collection of books for reference. But not the least important thing would be that by the aid of this union they, the chemists of the town and country, would extend their acquaintance with each other, and cultivate those feelings of esteem and friendship beneath whose influence minor differences and jealousies would merge into one determined effort for the general good. Having explained the rules and objects of the society he expressed a hope that the members would support the society by their presence at their regular meetings, and not be satisfied with subscribing only. He deprecated the introduction of anything of a private or trade character at their meetings. He thought the moral influence of a society like theirs would do more to raise their profession or trade than anything else. The president then proceeded to explain the provisions of the Pharmacy Act, and having commented on them and pointed out certain peculiarities, stated that, on the whole, he considered that there were but few imperfections in it, and even those were under consideration, and he trusted that they would be soon modified. He thought that a little common sense, little discretion, few poison labels, and a registering book, were all they required to carry out the provisions of the Act without difficulty. He then referred to the relative position of the chemist and the medical man, and also on the decrease of pharmaceutical remuneration in comparison with increased education. He then addressed himself particularly to the younger members present, and enjoined them to avoid if possible superficial knowledge, and discountenance cramming when called upon to pass the examinations of the Pharmaceutical Society. Nothing was more injurious—nothing so easily detected by the examiners—nothing so fatal to success. A little knowledge well learnt was better than an attempt at much without real foundation.

There was a large attendance, and a cordial vote of thanks awarded to Mr. Atherton for his excellent address.

A discussion of an interesting character on the Petroleum Act ensued, and the meeting shortly afterwards dispersed.

MEETING OF CHEMISTS AND DRUGGISTS IN NEWCASTLE.

On the 9th inst., a meeting of fifty-nine chemists and druggists was held, in the lecture theatre of the College of Medicine, Newcastle, "to receive the report of the committee appointed by the meeting of January 11th, for the purpose of conferring with the Council of the College of Medicine on the subject of Pharmaceutical Lectures." Mr. Swan took the chair.

Mr. Barnard S. Proctor, the Secretary, read the following report:—

"Your committee have to report that they communicated to the Secretary of the College of Medicine the proceedings of the meetings at which they were appointed, and, in reply, they were informed that the College had appointed a sub-committee to receive your deputation. A meeting of the two committees was accordingly held on the 8th of February, 1869. At this meeting, your committee felt that the object in view would be promoted rather by a free and friendly interchange of opinions than by the submitting of any formal proposition; and your secretary opened the discussion with the following suggestions:—That it is desirable that the College should make such changes in their lecture arrangements as would adapt their courses to the wants of pharmacy students. That, with this object, the College should institute a course of lectures on pharmacy. That the course upon materia medica would be better adapted to the pharmaceutical students if it were found practicable to separate therapeutics from materia medica proper. That it would be desirable that not more than two of the pharmaceutical courses should be going on at one time, and that the best arrangements would probably be to continue botany and materia medica as part of the summer session, and chemistry and pharmacy in the winter. That it is desirable to fix the fees of the pharmacy students at as low a sum as the College can prudently adopt for the present, and re-arrange them at such time as might be considered to have afforded a fair opportunity to the young men already engaged in the trade to take advantage of the lower fee.

"A general conversation ensued, in which the above and many other points of detail were considered. The proceedings of this meeting having been communicated to the College by their committee, they expressed their general concurrence with our views. Their letter, stating that it would be better that pharmaceutical students should be educated in the College of Medicine, than that a separate institution should be formed for the purpose; that they would add a course on practical pharmacy; that pharmacy students would attend the present course on materia medica, including therapeutics; that courses on chemistry and pharmacy would be delivered in the winter session, botany and materia medica in the summer, and the lecture hours would not be in the middle of the day; that a lecturer on pharmacy would be appointed according to rules and constitution of the College, and that the payment of a composition fee of £6 6s. would entitle the student to attend the above courses, in any order, and at any time, till his examinations should be passed. That the £6 6s. fee being below the regular scale, was instituted for the benefit of those who were engaged in the business before the passing of the Act, and would only apply to those who might enter within two years.

"There are only two points in this letter upon which your committee feel it necessary to offer any explanatory remarks. First, with regard to the retention of therapeutics as a part of the Materia Medica course, the suggestion of its withdrawal was made mainly with the desire of showing our wish to avoid even the appearance of encroaching upon the province of the medical practitioner. Any information upon the application of medicines to the cure of disease will always be acceptable, inasmuch as it adds to the intelligence with which the pharmaceutist pursues his calling. The second point is Clause 6, in reference to which it is only necessary to add that, while the College express their willingness to contribute to the preliminary expenses, they naturally avoid making themselves liable for any extravagant expenditure for apparatus, etc., should such be incurred by the lecturer. Any contribution either from the College or the chemists and druggists would, of course, be purely voluntary, and not necessarily of large amount. The council of the College having thus acceded to your request in every particular, your committee earnestly recommend that you give the matter your cordial support, by affording every facility and encouragement to your young men to avail themselves of the courses of lectures which are thus about to be instituted for their benefit. In conclusion, your committee congratulate you upon the success of the first step towards the important object in view, and express their confident hope that you have given the initiation to the establishment of a faculty of pharmacy, which will be a worthy associate of the many noble institutions with which we are surrounded. Tyneside has ever been noted for the leading position it has taken in the progression movement of the times—standing foremost in the application of sciences to manufactures, great as a centre of engineering in all its

branches, great in its application of chemistry, equally great as an active centre of the natural history sciences. It possesses all the elements out of which a noble position may be taken in its relation to pharmacy. The energy and industry which characterise our neighbourhood, thrown into the pharmaceutical curriculum now before us, cannot fail to make it such a success as has hitherto not been attainable in the provinces."

The CHAIRMAN moved the adoption of the report.

Mr. H. B. BRADY, in seconding the motion, made a few remarks on the report which had just been presented. At their last meeting they agreed that something must be done in connection with the recently passed Pharmacy Act, else the pupils who go up from establishments in Newcastle could scarcely meet with a success in their endeavours to pass the examinations set by the Pharmaceutical Society, and which are now necessary. They then agreed that the only course to adopt was what had been detailed in the report—the formation of pharmaceutical lectures in connection with that College. In doing that they had the experience gained by their former efforts many years ago to establish a distinct school of pharmacy for this place, and the district of which it is the centre. It was then found that their individual efforts and unassisted efforts were sufficient to keep going, for a limited time, a very respectable set of classes; but they were not sufficient to go to form a school on a permanent basis, and besides that the fact of one educational establishment already existing, whose duty it was to teach all those branches, with the exception of practical pharmacy, which are required by the pharmaceutical curriculum, it was obviously a saving of labour if the instruction to be required could be obtained from such an already established course. With respect to students, the question naturally came before them what amount of study will be required for these examinations, and should they aim merely at giving the instruction so as to merely enable them to pass the minor examination, which would be sufficient to permit them to take their place amongst chemists and druggists, or so as to enable them to pass with credit both the minor and the major examinations; to accomplish the former would be a great gain, to accomplish the latter would be infinitely greater. The next question was the fees, and in this they had been most handsomely met by the College of Medicine. They had very much relaxed the ordinary fees their own students pay, for the benefit of young pharmaceutical students. And, although £6 6s. might seem a large sum to take at one time for a series of lectures, it was not a large sum when they came to consider the amount of knowledge desired. If they considered that in the courses of lectures the students practically receive a great deal more than they would receive from the whole of the curriculum at the college at Bloomsbury-square, London; and if they considered that they would receive the same education which medical men receive, as far as relates to pharmaceutical subjects, and that a single session will contain from 100 to 200 lectures, they would see that the fee was an exceedingly small fee, and that it was also small in proportion to the fee imposed on medical students for similar advantages. They (the masters) would would have to undergo some sacrifice themselves, but the sacrifice would not, by any means, be all on the side of the young men; they must be content for the prospective good. He trusted none of pharmaceutists of the neighbourhood would consider any proposal coming from his young men, to be liberated for a certain hour during a day to attend a certain lecture, as in any way unreasonable. He would only say that he most heartily seconded the motion which had been made from the chair—that the report be adopted—and hoped that they would all endeavour to the utmost of their power to make such an arrangement as that proposed. (Applause.)

The adoption of the report was carried.

Mr. PROCTOR, sen., characterised the arrangement made by the College of Medicine as liberal. He moved "that the committee be requested to continue their services; that they draw up a reply to the communication from the college in accordance with the views which have been expressed at this meeting."

Mr. A. HUME seconded the motion, which was carried.

The CHAIRMAN said they could not but feel satisfied at the result they had arrived at. He moved that the thanks of the meeting be given to the council for the loan of the room.

Mr. JOSEPH FAIRS seconded the motion, which was agreed to.

A vote of thanks to the chairman terminated the proceedings.

BIRMINGHAM CHEMISTS' ASSISTANTS' ASSOCIATION.

WE are glad to say this Society is still progressing steadily, and in point of numbers and finances compares favourably with other provincial associations. The meetings are well attended, and great interest is expressed by the members in the subjects under discussion. On the 17th ult., the President, Mr. W. CHURCHILL, read a paper on "The Life of a Plant." He described the functions of the root, stem, and leaves, and the rise of the crude sap, and its elaboration in the leaves. He then spoke of the respiration of plants, comparing it with that of animals, and remarking on the balance of power which exists between the animal and vegetable kingdoms.

On the 24th ult., the Hon. Secretary (Mr. Percy Micklow), read a paper entitled "Our Duties." The speaker dwelt upon the necessity of mutual co-operation, which was as much required since the formation of the Society, in order to preserve unanimity of feeling, as it was prior to its foundation. He referred to the duty which all members should share, *i.e.*, that of reading papers, especially as original researches were not at present called for, but merely the painstaking collection in a monograph of what was already known on the subject undertaken. Mr. Micklow urged upon his auditory their duty to use their most strennuous efforts to gain additional members to the Association, and to advance its interests in every possible way.

On the 3rd inst. Mr. ADAMS read a paper on "Carbonic Acid." He mentioned the various names by which it had been known at different times, viz. "gas sylvestre," "aerial acid," "cretacious acid," etc., and that Dr. Priestley, of Birmingham, first discovered that it entered into the composition of the atmosphere. The lecturer showed the use of carbonic acid in arresting every malignant vapour at the moment of its formation, by the putrefaction process, and also showed its hostility to animal life by that peculiar phenomena, the Grotti del Cane, in Italy; and concluded a well-written and pertinent paper by a short Essay on the "Preparation of Artificial Mineral Waters," endeavouring to prove that their therapeutical effect was equal, if not superior to that of the natural waters.

MANCHESTER CHEMISTS' AND DRUGGISTS' ASSOCIATION.

THE fourth monthly meeting was held at Union Chambers on Friday evening, March 5th, Mr. N. S. Brown, Vice-President, in the chair.

A donation of the *Pharmaceutical Journal* from the Society was announced.

Mr. F. BADEN BENGER (Hon. Sec.) then gave a lecture on "Some of the Effects and Applications of Current Electricity," illustrated by numerous experiments, working models of electro-motive machinery, telegraphs, apparatus for exploding mines, electro-motive jewellery, etc. The Electric Light was shown, and Browning's new Automatic Electric Lamp explained. A series of large Geissler's Vacuum Tubes was also exhibited.

The usual vote of thanks having been proposed and carried, it was announced that Mr. J. T. Slugg, F.R.A.S., would deliver a lecture on "Spectrum Analysis," at the next monthly meeting, to be held on Friday, April 2nd, at 3 p.m.

THE SANDFORD TESTIMONIAL FUND.

Subscriptions already published in THE CHEMIST AND DRUGGIST £351 9 0

	£	s.	d.
Anness, S. R, Ipswich ..	0	5	0
Atherton, J. H, Nottingham	0	10	6
Alcock, J. F., North Walsham	0	10	0
Andrews, F., Bayswater ..	0	5	0
Buchanan, Jas., Edinburgh	1	1	0
Brown, Thomson, Glasgow	0	5	0
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Bartt, F. J., Newark	0	2	0
Barry, J. & E., Northampton	1	1	0
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Bayley, E., Walworth-road	0	10	6
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Charles, Thomas, Holborn	0	10	6
Cleaver, E., 63, Oxford-street	1	1	0
Cock, James, Falmouth	0	5	0
Coleman, E. J., Cardiff	0	3	0
Collings, James, Littlehampton	0	2	6
Croppes, J. S, Hanley	0	5	0
Cross, W., Cardiff	0	5	0
Cunningham & Sparrow, Pimlico	2	0	0
Coles, Mr. Charles, King's College-road, N.W.	0	10	6
Cocking, George, Ludlow	0	5	0
Duncan, Flockhart, & Co., Edinburgh	2	2	0
Dadford, Mr., Northampton	0	5	0
Davis, D. F, Leominster	0	10	6
Dickinson, J., Gt. College-street	0	10	6
Drane, P., Cardiff	0	5	0
Duncan, S., Greenock	0	2	6
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Elsbury, John, Liverpool	0	5	0
Edwar, J. J., London	0	5	0
Edes, J., Marden	0	3	0
Elkin, Charles, Bath	0	10	0
Ellis, T. W., Loddon	0	5	0
Elfland, Mr., 197, Waterloo-road	0	5	0
Fisher & Sons, Ramsgate	1	1	0
Fells, John, Clapham	0	2	6
Fentiman, G. E, Smithfield	0	5	0
Forster, E., Preston	0	2	6
Freeman, R. Kennington Park-road	0	5	0
Freeman R. P., Lewisham	0	8	0
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Foulkes, W. A., Rhyl	0	5	0
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Fever, W., Olney	0	5	0
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Greenwell, Alfred, Everton	0	2	6
Gardner, Charles, Tunbridge Wells	0	10	6
Gower, Alfred, Tonbridge	0	10	6
Godfrey, P., Newton Abbot	0	2	6
Gale, H., 3, Millbank-place, N.W.	0	10	6
Gankley, W. B., Arnold	0	2	6
Gaunt & Fuller, Union-st., Boro'	0	10	6
Gedge, W. S., Clerkenwell	0	10	6
Gill, G. W., Walworth-road	0	2	6
Glanville, F., London	0	5	0
Greaves, E. S., Cardiff	0	5	0
Green, G., Greenwich	0	10	0
Griffin, H. S., Burton-on-the-Water	0	5	0
Grindall, Mr., Hull	0	2	6
Grislock, T., South-street	0	5	0
Gunner, J., Lambeth-walk	0	5	0
Gwatkin, J. T., Brighton	0	10	0
Gall, W., Bampton	0	3	0
Griffiths, John, Clerkenwell	0	5	0
Gaitskell, J., Gosforth	0	5	0
Grant, Mr., Exeter	0	2	6
Green, J. G., Bilston	0	5	0
Garrod, Dr., F.R.S., Harley-street, W.	1	1	0
Halrick, R., Glasgow	0	5	0
Hart, H., Glasgow	0	5	0
Howard, R., Tunbridge Wells	0	10	6
Harris, George, Buckhowell	0	5	0
Hirney, T., Leeds	0	5	0
Halley, Richard	0	5	0
Holloway, J., Carlisle	0	5	0
Hands, J., Campden	0	10	0
Harrison, J. P., Carlisle	0	5	0
Heeley, J., Kennington-rd.	0	5	0
Harr son & Parkinson, Bradford	1	1	0
Hicks, J., Bradford	0	10	6
Hickey, K. L., London	0	5	0
Hill, W. T., Cardiff	0	2	6
Hillridge, George, Preston	0	2	6
Hodgson, G., Greenwich	0	5	0
Houghton, W, Preston	0	5	0
Howard, George, Greenwich	0	10	0
Howell, M.	0	10	6
Hughes, H. D.	0	5	0
Hunter, James, Dewsbury	0	5	0
Hyslop, J. C., Edgware-road	0	5	0
Hall, H. R., Hull	0	5	0
Havill & Son, Tiverton	0	5	0
Haydon, H., Tiverton	0	2	6
Hughes, John, York Glass Company	1	1	0
Hollier, E., Dudley	0	10	6
Husband, M., Exeter	0	10	6
Haudcock, John, Leeds	0	5	0
Hurst, John, Louth	0	10	0
Hurst, John B., Louth	0	5	0
Iverach, J. G., Kirkwall	0	10	0
Jaap, J., Kensington	0	5	0
Jones, Humphrey, Llangollen	0	5	0
Jackson & Co., Westwood	0	5	0
Jackson, James, Heywood	0	2	6
James, J. P., Cardiff	0	10	6
Johnson, B., Tottenham Court road	0	12	0
Jones, F., Flint	0	5	0
Jones, James, Salford	0	5	0
Jones, Wm., Horsel's Bush	0	5	0
Jay, F. W., Cardiff	0	10	6
Kinninmont, A., Glasgow	1	1	0
Kennedy, W., Glasgow	0	5	0
Keen, J., Southwark-street, S.E.	0	2	6
Kennerstone, F., Hoxton	0	2	6
King, Mr. (late of Hodgkinson, Luckombe, & King).	2	2	0
Keal. F. P., Swansea	0	2	0
Lawrence, John, Glasgow	0	5	0
Lyon, R., Ipswich	0	5	0
Lane, J. W., Southwark-st.	0	2	6
Lignera. H. L., Aldgate	0	10	6
Lloyd, J., Swansea	0	2	6
Linday, Mr., Horsham	0	2	6
Lock, William, Boston	0	10	6
Miller & Co., Tunbridge Wells	0	10	6
Millidge, T. E., Tonbridge	0	5	0
Maddock & Co., Ipswich	0	10	6
Marchant, C., Ipswich	0	5	0
McCathey, C. J., Cardiff	0	5	0
McCreery, J., Kennington Park	0	5	0
Macpherson, A., Stowmarket	0	4	0
Mayger, Mr., Northampton	0	10	6
Merrick, Mr., Northampton	0	5	0
Middleton, J., Middleboro'	0	5	0
Miller, H., Battersea	0	2	6
Moore, J., Pembroke Dock	0	5	0
Morgan, F. G., Petworth	0	5	0
Morris, T., Southwark-st.	0	2	6
Moss. W., Carlisle	0	5	0
Moseley, W., Kedditch	0	5	0
Moorbray, H. G., Manchester	0	5	0
Muskett, James, Harleston	0	10	6
Metcalf, E., Lower Tooting	0	10	6
Marshall, R., Boston	0	10	6
Nicholson, A., Tunbridge Wells	0	10	6
Newey, J. T., 17, Bloomsbury-square, W.C.	0	5	0
Nix, J., Billericay, Essex	0	5	0
Nix, J. J., Billericay, Essex	0	5	0
Noaks, R., Brighton	0	10	0
Norfish, H., Tiverton	0	5	0
Napier, G. L., Exeter	0	2	6
Nuid, J., Boston	0	5	0
Orpe, T. M., Old Kent-road	0	10	6
Owers, R. C., Southwark-st.	0	2	6
Owles & Son, Yarmouth	0	10	6
Pickering, B., Brompton, S.W.	0	10	6
Panes, George, Southboro'	0	5	0
Ponsford, J., Newton Abbot	0	5	0
Parry & Garnham, London Bridge	0	10	6
Pasmore, J., London	0	5	0
Pearce, Josh., Crewkerne	0	10	0
Phillips, W., New Cross-rd.	0	5	0
Pitts, R. C., Norwich	0	10	0
Polls, W. C., Yarmouth	0	2	6
Preston, A. P., Blackmanstreet	0	2	6
Price, J., Southwark-street	0	1	0
Pullen, Mr., Northampton	0	5	0
Pilley, S., Boston	0	5	0
Pickering, Mr., Horsham	0	2	6
Portes, Mr., Exeter	0	1	0
Polk, John, Exeter	1	1	0
Pratt, Josiah, Wolverhampton	0	5	0
Price, William, Birmingham	0	2	6
Quibell, Thomas O., Newark	0	5	0
Quiller, C. R., London	0	10	6
Robertson & Co., Edinburgh	1	1	0
Raimes, Bla chards, & Co., Edinburgh	1	1	0
Rose, Mr., Glasgow	0	2	6
Rarley, W. M. V., Sheffield	1	1	0
Ramsbottom, George, Waterford	0	5	0
Rawling, J., Hackney-road	0	5	0
Rayner, I., Poplar	0	5	0
Richards, H., Southwark-st	0	2	6
Richards, W. R., Camberwell-road	0	10	6
Robinson, J., Middlesboro'	0	2	6
Robinson, J. C., North Shields	0	5	0
Roderick, Thos., Pontypool	0	5	0
Rogerson & Son, Bradford	1	1	0
Rowse, F. J., Clapham	0	5	0
Rowe, C. R., Middlesboro'	0	2	6
Rossiter, G., Tiverton	0	2	6
Spaar, G. J.	0	5	0
Salter, T., Boston	0	2	6
Sells, Robert, Tunbridge Wells	0	10	6
Sutton, Francis, Norwich	0	10	6
Smith, Jeremy, Ipswich	0	2	6
Savidge, J. M., Northampton	0	5	0
Sayer, J., Carlisle	0	5	0
Sealey, W., Southwark-st.	0	2	6
Shipman, Mr., Northampton	0	5	0
Silvers, Mr., Yarmouth	0	2	6
Simpkins, J., Minchinhampton	0	5	0
Smith, T. & H. & Co., London and Edinburgh	2	2	0
Smith, Simpson, Middlesboro'	0	5	0
Speechley, G., Bishop's Stortford	0	5	0
Speller, J., Southwark-st.	0	2	6
Stagg, J. H., Yarmouth	0	2	6
Stansfield, R., Haverstockhill	0	5	0
Stevens, P. A., Hoxton	0	10	6
Stewart, Chas. F., Cardiff	0	10	0
Sugns, W. G., Cardiff	0	5	0
Sutcliffe, J., Clapham	0	2	6
Silverton, J., Knutsford	0	10	0
Smart, John, Scarborough	0	5	0
Sowerby, John, Carlisle	0	5	0
Smith & Sons, Norwich	1	1	0
Staning, W., Hull	0	5	0
Sanders, J. L., Tiverton	0	5	0
Shaw, E. P., Wakefield	1	1	0
Saer, D. Frothero, Peumbroke Dock	0	5	0
Spencer, T., Workingham	0	10	6
Tait, W., Edinburgh	1	1	0
Taylor, W. J., Middlesboro'	0	5	0
Taylor, W. R., Middlesboro'	0	2	6
Taylor, H. H, Middlesboro'	0	2	6
Trelford, H, Ilminster	0	10	0
Thomas, K. & J., Bournemouth	1	1	0
Thomas, Sam., Stanstephen	0	2	6
Thomas, A., Carlisle	0	5	0
Todd, L., Preston	0	5	0
Turner, John, Aylesbury	0	10	6
Twinberrow, John, Worcester	0	5	6
Thomas, J. H & Son, Boston	1	1	0
Utley, Mr., Liverpool	0	5	0
Vinter, T. D., Sunderland	0	10	6
Williamson, James, Scarborough	0	5	0
Wilmer, L. M., Tonbridge	0	5	0
Walsh, J. E., Tunbridge Wells	0	10	6
Wright, G. H., 7, Poultry, E.C.	1	1	0
Williams, John, 5, New Cavendish-street, W.	2	2	0
Whitaker, W., Ipswich	0	5	0
Wiggin, J., Ipswich	0	5	0
Whiteman, T., Ipswich	0	5	0
Walker, Mr., Bradford	0	10	6
Walker, W., Preston	0	2	0
Warren, A., Blackman-st.	0	5	0
Wastie, F., Kennington-Cross	0	5	0
Waterton, W., Wandsworth-road	0	2	6
Welchman, Mrs., Northampton	0	5	0
Wiggins, H.	0	7	6
Wilkinson, Bridge, & Co., Regent Circus	0	5	0
Williams, R., Brixton	0	5	0
Williams, T., Cardiff	0	10	6
Willsher, S. H., Tenterden	0	5	0
Wilson, Richard, Clay Cross	0	5	0
Wilson, S., per H. Bardsley	0	2	6
Williamson, W., Hanley	0	5	0
Wilson, J. F., Essex-road	0	5	0
Wright, G. F., Glo'ster-place	0	2	6
Wright, J., Yarmouth	0	1	0
Wood, William, Pontypool	0	2	6
Wood, H., Tiverton	0	2	6
Williams, Phillip, Horsham	0	10	0
Williams, Elias, Cerrig-y-Druidion	0	5	0
Young, W.	0	5	0
Young, Richard, Preston	0	2	6
York Glass Company, per Mr. John Hughes	2	2	0

Gentlemen who have not yet paid their subscriptions are requested to be good enough to remit the amount at once to the Treasurer, Mr. B. B. Orridge, 32, Ironmonger-lane, London, E.C., or to Elias Bremridge, 17, Bloomsbury-square, London, W.C.

The following circular has been issued:—

"The 'Sandford Testimonial Fund.'

"March, 1869.

"Dear Sir,—The Committee having decided to close the Subscription List to this Fund on the 7th of April next, we beg to ask if you desire your name to be added thereto.

"We are, dear Sir,

"Yours faithfully,

"MICHAEL CARTEIGHE, 172, New Bond-street, London, W.,

"JOHN MACKAY, 119, George-street, Edinburgh,

"HENRY MATTHEWS, 60, Gower-st., London, W.C.,

"*Hon. Secs.*"

DREADFUL NAPHTHA EXPLOSION.

On Wednesday last (the 10th inst.) an explosion occurred at the extensive chemical works of Messrs. Lewis, Demuth and Co., at Oldbury, near Birmingham. Four men were killed and several seriously injured. It is scarcely necessary to inform our readers that Messrs. Demuth are manufacturers of naphtha, and other chemicals to be extracted from gas tar, and produce, amongst other things, the celebrated aniline dyes.

About a quarter to one on Wednesday afternoon a loud report announced to the people in the town and in the neighbourhood for several miles round that an accident had occurred, and immediately there was great excitement in every quarter. Speedily the works were crowded and the banks of the canal lined with people, to whom the character of the catastrophe was at once clear. A retort, in which the primary process was going on, had burst, and had laid the buildings which it had occupied in ruins. The flames had communicated to the barrels of spirit piled in the yard, and instantly there was a raging, roaring fire, such as the people of Oldbury—used as they are to the element—say they never saw before. It was like a vast seething cauldron. The smoke was dense, and the livid fire which shot up amongst it made the picture horribly grand. When the fire was got under, the mutilated bodies of the workmen were discovered. The names of those who lost their lives are James Ellement, aged 24; Samuel Pickerill, aged 19; Simon Rollason, aged 26; and Joseph Forrester, 38. The inquest on their bodies was opened on Thursday.

As to the cause of the accident, information there is none. The retort, or boiler, had been in use only about half a year; and only last week it was inspected by the official of a company in which it is insured. The theory of the explosion most probably is that the fire was communicated to the combustible spirit in the retort. The retort itself, which is of enormous weight, was blown through the air to a distance of about forty yards. Its flight was described by an eye-witness as like that of a balloon. It cleared entirely the works of Mr. Richards, and dropped upon the ground just outside the wall of that gentleman's premises, where it remains. The laboratory was reduced to ruins, and such was the intensity of the heat that the metal and glass which the building contained were fused together in great cakes. The stationary fire-engine on the works could not be used, in consequence of the nearness of the building in which the explosion took place.

The amount of damage is not yet ascertained; but probably it will amount to £3,000 or £4,000. That, however, is an estimate which may be in excess or not of the figure. Messrs. Demuth are not insured, by reason, perhaps, of the risk of the manufacture.

A meeting was held at Oldbury on the 12th inst., the Rev. W. T. Taylor, vicar, in the chair. There were also present the Rev. Henry McKean, William Henry Hayward, Esq., William Marsh, Esq., Samuel Marsh, Jun., Esq., Henry Sainsbury, Esq., Walter Showell, Esq., Alexander Chance, Esq., Mr. James Hartill. It was determined, if possible, to raise a subscription of £300, in order to be eble to afford permanent relief to the widows and orphans of the deceased Amounts to upwards of £150 were given in. Mr. Alexander Chance was appointed treasurer, and Mr. Hartill secretary.

LAW AND POLICE.

DR. DULCAMARA REDIVIVUS—WARDLE v. WALLER.

An amusing action for a malicious prosecution came before Mr. Justice Hayes and a special jury, at Derby, on the 5th inst. The plaintiff described himself as a "medical botanist," and was in the habit, according to the opening statement of his learned counsel (Mr. Digby Seymour) of going about the country in a van and delivering a series of useful lectures on the anatomy of the human form divine, which he illustrated with bones, diagrams, and a curious but not pleasing collection of certain things in bottles. His van opened with a platform in front, and he would take his stand upon the platform and attract crowds who came to listen to him. On Easter Monday last he set up his van in Chesterfield Market-place, and paid 18s. a week for the use of the ground; but it was disputed by the defendant that anybody had a right to allow his van to remain upon the Market-place. The van was placed about twenty-seven yards from the defendant's house. The defendant requested the plaintiff to remove his van, and the plaintiff removed it to the other side of the Market-place, opposite the house of the defendant. Defendant then gave notice that he must remove the van, or in default of so doing that evening he would be indicted at the Quarter Sessions. On the 22nd the plaintiff received notice to remove on the 29th, and he was prepared to leave, when he was surprised to receive a summons to attend before the Mayor of Chesterfield. The plaintiff removed his van, and paid 10s. 6d. by order of the Mayor. On the 1st of July an indictment was presented against him by the defendant at the Quarter Sessions, and a true bill found, and upon the application of the defendant a warrant was issued for his apprehension, although a summons would in ordinary cases be the usual form of proceeding. Three policemen in uniform came to serve the warrant, and conducted the plaintiff across the Market-place on market-day. At the trial of the indictment at Quarter Sessions the plaintiff was *Acquitted*. The cross-examination of the plaintiff occasioned great laughter in court. He went by the name of Dr. Grant. He was called Grant because when he went to Leeds to lecture the parties who had taken him down there posted bills up calling him Dr. Grant, and as he had been there before they wanted a new man. He was called "Doctor" because he was a public teacher, and "Doctor" was the Latin for teacher. He kept a skeleton in a box, and showed it for purposes of instruction. He also had large diagrams outside his van representing sections of the human body. Being asked what a section was he replied, "Something taken from something else." His Lordship said a section was a part of a dis-section. The plaintiff said his house was "contagious" to the defendant's house, and that the defendant used to come out in front of his house and posture about while the plaintiff was lecturing, which only made the people symphathise with him the more. Sometimes 200 or 300 persons would attend in front of the van. Bills were posted about the town, headed, "A Tory fly in a treacle pot," and concluding with "God Save the Queen and Dr. Grant," "Working men, attend in your thousands," and other similar announcements. The diagrams which the plaintiff exhibited were issued and published by order of the Department of Science and Art, and were stated by the plaintiff to be an honour to the town where they were exhibited. At the close of the plaintiff's case, defendant's counsel (Mr. Overend) submitted that no absence of reasonable and probable cause for prosecuting the plaintiff had been shown by the plaintiff's case, and his Lordship having so ruled, the plaintiff was obliged to submit to a nonsuit.

COMPENSATION FOR BODILY INJURIES.

At the Durham Assizes on the 27th ult., Mr. J. A. Jackson, a surgeon's assistant, obtained a verdict against the United Kingdom Electric Telegraph Company with £400 damages, in compensation for injuries sustained through his being tripped up by a telegraph wire which, while undergoing repair, had been left at night hanging between two posts.

ILLEGAL SALE OF POISON.

At the magistrates' office, Spilsby, Wm. Butler, of Horncastle, hawker, was charged with selling laudanum not having a label on the bottle with his name and address printed thereon, at Bolingbroke, on the 5th inst. Mr. Brackenbury appeared for the defendant, and admitted that the evidence of the policeman who bought the poison was correct, but he stated the defendant was the servant (duly registered) of Mr. W. P. Carlton, druggist, Horncastle. He travelled for Mr. Carlton, and as such servant Mr. Carlton took out a licence for him to hawk goods, principally tea, but that he also sold laudanum. The cart with which he travelled when the laudanum was purchased by the police-constable was a new one, and the maker had painted on it the name of the defendant, contrary to Mr. Carlton's instructions. The magistrates considered the case proved, but as it was the first under the new Act, they thought justice would be satisfied if the case was withdrawn on payment of expenses, which was agreed to. It is stated that numerous vendors of poisons (especially of laudanum) in the villages of this district completely laugh at the recent Act, and that under the pretence of selling patent medicines the trade in the deadly drug is still carried on to a very large extent.

BANKRUPTCY.

IN RE JOHN REEVE, DRUGGIST, BIRMINGHAM.

An adjourned meeting for last examination and discharge was held before Mr. Commissioner Sanders, at the Birmingham Bankruptcy Court on the 26th ult., Mr. Motteram for the trade assignees, Mr. Griffin for creditors, Mr. Filter for the bankrupt. Liabilities: to unsecured creditors, £3,827 3s. 9d.;

on bills discounted, £397 18s. 10d.; creditors to be paid in full, £62 10s.; total, £4,287 2s. 7d. Assets: by debts, £132 19s. 7d.; property in the hands of creditors, £522 8s. 10d.; total, £655 8s. 5d.; leaving a deficiency of £3,631 14s. 2d. to be accounted for.

Bankrupt's statement to the official assignee was read over as follows: "Commenced trading in 1851 as chemist and druggist; capital £800, left me by my grandfather, being then of age; carried on for about eleven months, then paid a composition of 7s. 6d. in the pound to all my creditors—about £1,500. The assets showed the 7s. 6d. Then took a situation, and continued in the same for about five years. Then joined W. Boaler as wholesale druggist; my capital, none: all capital found by W. Boaler. Carried on for about five years and a half, then dissolved, he agreeing to take all assets and meet all liabilities. Then in about 1860, I commenced on my own account as wholesale druggist. No capital; obtained credit, also accomodation bills; carried on to August 1865. Then made a composition, and paid 1s. in the pound to all my creditors—about £6,000. Then commenced again as wholesale druggist. No capital, but renewed a liability of £650. Obtained credit, and also accommodation bills, and carried on till now. Cause of deficiency: renewed liability £650; very heavy charges for discounting bills; large family—six children; bad debts since August, 1865; about £500 loss by forced sales to meet bills. Present cause of bankruptcy, three writs on bills, caused by not being able to get accommodation bills renewed."

The Commissioner asked how Mr. Allcock came into fellowship with such a man as the bankrupt. The bankrupt replied that Allcock was a relative, and the gentleman with whom he had been dealing in accommodation bills. The amount in accommodation bills would not amount to £20,000, and his losses would amount to, during the past twelve months, £1,200 or £1,300, but he could not say.

Mr. Motteram said he would not ask the bankrupt any more questions now, but would apply that separate accounts, with dates, be furnished of the dealings of bankrupt with Allcock; Read, the person to whom he sold the gum; and with Cooper, of Dudley. The accounts, which had already been filed, were referred to an accountant, and the new accounts were ordered to be filed.

The Commissioner: A more discreditable examination I think I never heard.

The meeting was adjourned to the 26th of April.

GOSSIP.

The Royal Commission appointed to inquire into the Standard Weights and Measures met on Saturday, the 6th inst., at 7, Old Palace-yard. Present: The Astronomer-Royal, Lord Colchester, the Right Hon. Stephen Cave, M.P., Sir J. G. S. Lefevre, K.C.B., the President of the Royal Society, the Master of the Mint, Professor W. Hallows Miller, and Mr. H. W. Chisholm. Mr. H. J. Chaney, the Secretary, attended.

The Principal of the Laboratory of the Inland Revenue Department, Mr. G. Phillips, reports that the consumption of tobacco in this country continues to increase. The quantity cleared for consumption in the United Kingdom in 1841 gave an average of 13½oz. per head of the (estimated) population; in 1851, 11b. 0½oz.; in 1861, 11b. 3½oz.; in 1865, 11b. 5oz.; in 1866, 11b. 5¾oz.; in 1867, 11b. 5¾oz.; the increase being inappreciable in that year when divided by the number of the population. This may be partly due to the depression of trade, and partly to the quantity cleared in 1866, showing an increase of more than 2,000,000lb., and being large enough to leave more stock in hand thnn usual.

Trade Memoranda.

WE may remind such of our readers as think of commencing the wine trade, that licences for this purpose date from the 5th April.

The following firms have recently accepted agencies for the Litre Bottle Wine Company:—George Lambel, Glasgow; James Keith, Hamilton; R. Hiscock, Frome; Shrapnell and Sons, Bristol; James Oliver, Ayr; G. Scott, Belfast; Davies, Gosport; Chambers, Portsmouth, Southsea, and Gosport; H. Clarke, Fareham. The Litre Bottle Wine Company have now appointed 300 agents for the sale of their wines.

Messrs. Kinloch and Co. call the attention of druggists to their "Catalan" wines, and offer agencies for these.

Messrs. Palk and Son, of Exeter, have bought the business of Mr. H. Lloyd, Dawlish.

Messrs. John Bailey and Co., of the Albion Brass and Iron Works, Salford, are now the exclusive makers of Bushby's Pill Machine, and are working the patent both in England and abroad with considerable spirit. Messrs. Bailey manufacture many inventions for the use of chemists, one of which (Ingram's Oil Tester) was described in the CHEMIST AND DRUGGIST in April last. We hope shortly to bring some of their other manufactures under the notice of our readers.

The wholesale firms of Hostetter, Smith and Co., and Reddington and Co., both of San Francisco, have amalgamated their businesses, which will in future be carried on under the title of Reddington, Hostetter and Co. We made a similar announcement last month respecting two Dublin firms. There is not much probability that the examples will be largely followed, and it would be hardly desirable that they should.

Messrs. Walls, Close and Co., druggists' sundriesmen, are relinquishing business, and offer their stock at reduced prices. Their lists will be found among our advertisement sheets.

A correspondent of the *Scientific American* suggests a safe and ingenious plan of extinquishing the light of kerosene lamps. A usual plan is to turn it down low, and then blow from under the glass; this, however, requires some dexterity and a good bit of wind. The proposal we refer to is to turn the wick up so as to produce a large flame, but not high enough to smoke; then blow squarely *across* (not down) the top of the chimney. By so doing a strong current of air is forced across the top of the chimney, and produces a corresponding current up through the chimney; the latter current lifts the flame off from the wick, and instantly extinguishes it.

GAZETTE.

BANKRUPTS.

BARRETT, C. A., Wallingford, surgeon.
BEACROFT, R. J., Brighton, dentist.
BESLEY, F. B., St. Martin's court, Leicester-square, surgeon.
BROWN, S., Blackfriars-road, perfumer.
EVANS, W. L., Cardiff, chemist.
GILES, E., Taunton, chemist.
HARRIS, S., Mile-end-road, homœopathic surgeon.
OUGHTON, F., Regents Park-road, surgeon.
PUGH, P., St. Helen's, chemist.
SCOTT, B. V., Oxford, medical botanist.
SCRIVENER, C. W, Tiley, surgeon.
SMITH, W., Melford, surgeon.
WALTON, B. M., Minchinghampton, physician.
WATSON, J. L, Stockton-on-Tees, chemist.
WILLIAMSON, G., Birmingham, chemist.
YATES, E., and Co., Manchester, chemists.

PARTNERSHIPS DISSOLVED.

BARKER, E. J., and YOUNG, W. W., surgeons, Aldershot.
BOWMAN and SLATER, Ripon, surgeons.
CLAYTON, J., and HAWORTH, J., Church, manufacturing chemists.
DUNN, J., and NETTLESHIP, T., Market Rasen, soda-water manufacturer
FIELD, G., and ROBERTS, H. C., High-street, Southwark, whole druggists.
GERMAN, J., and ILIFF, F., Derby, surgeons.
HARMAN, J., and HELSHAM, H., Euston-road, surgeons.
JACKSON, J. J., and JACKSON, H., Liverpool, druggists' sundryman.
LUTTON, G. F., and MARBACK, P., West Cowes, chemists and druggists.
PHILLIPS, P. B., and HALL, J. F., Market Drayton, veterinary surgeons.
TURNER, M. F., TURNER, H., HARDY, R., and KEENE, J., New Bond-street homœopathic chemists, as far as regards J. Keene.
WOOD, H., and HOWARD, J., Ashton-under-Lyne, surgeons.

NOTES AND QUERIES.

BLUE-BLACK WRITING INK.—Mr. James Henderson, 4 Newbattle Terrace, Morningside, Edinburgh, has kindly forwarded to us the following receipt for preparing an excellent Blue-Black writing Ink which answers admirably as Copying Ink

Blue Aleppo Galls (free of insect perforations), 4½ oz.
Bruised Cloves, one drachm.
Cold Water, 40 oz.
Purified Sulphate of Iron, 1½ oz.

Pure Sulphuric Acid (by measure), 35 minims.

Sulphate of Indigo (in the form of a thinnish paste, and which should be *neutral*, or nearly so), ¼oz.

Place the galls, when bruised, with the cloves in a fifty-ounce bottle, pour upon them the water, and digest, shaking often daily for a fortnight.

Then filter through paper into another fifty-ounce bottle. Get out, also, the refuse of the galls, and wring out of it the remaining liquor through a strong clean linen or cotton cloth into the filter, in order that as little as possible be lost. Next, put in the iron, dissolve completely, and filter through paper. Then the acid, and agitate briskly. Lastly, the indigo, and thoroughly mix by shaking.

Pass the whole through paper.

Just filter out of one bottle into the other, till the operation has been completed.

On a large scale, this fine ink may be made by percolation.

The weights used are Avoirdupois, and the measures used are Apothecaries' measures.

NOTE.—No gum or sugar is proper, and on no account must the acid be omitted. When intended for Copying, 5½ oz. galls is the quantity.

R. F. T. (Manchester). — "Watts's Dictionary of Chemistry," published by Longman & Co., although addressed to chemists, will doubtless afford the kind of information your customer requires.

Correspondence

THE PETROLEUM ACT—BENZINE COLLAS.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—The Petroleum Act, 1858, has caused so much annoyance and uneasiness to the trade, that I venture to think the following details will prove acceptable to your readers.

I am the manufacturer of Benzine Collas, and I have had, in that capacity, the unenviable distinction of being one of the principal sufferers under the Act. As soon as I learned what its effect would be, I addressed a memorial to the Secretary of State, and obtained an appointment for an interview with the Under Secretary, the Hon. A. F. O. Liddell. I had been fortunate enough in the meantime to secure the hearty co-operation of the President, and several members of the Council of the Pharmaceutical Society. A list of the gentlemen who composed the deputation, and an account of the conversation which took place, are given in the last number of the *Pharmaceutical Journal*.

I am happy to state that the following letter has since been received (copy inclosed). There is therefore every probability that the trade will soon be relieved from a burden which it was never in the intention of the legislature to impose upon it.

As I am daily in receipt of letters from all parts of the kingdom, asking information on the subject, perhaps you will allow me to say that my agents, Messrs. Sanger and Sons, 150, Oxford-street, having at once applied for and obtained a licence, are sending out the Benzine Collas on the usual terms; and I have moreover reason to believe that several of the wholesale houses, which at first declined to supply the article, have since reconsidered their decision.

My best thanks are due to the President and Council of the Pharmaceutical Society for their cordial support, and to the Secretary of State for his prompt attention to a defect in the law which was calculated to do me an injury, and to entail much trouble and expense upon the trade.

I am, Sir, yours respectfully,

Brentford, March 8. E. THOMAS.

FROM THE UNDER SECRETARY OF STATE TO MR. THOMAS, THE PROPRIETOR OF THE BENZINE COLLAS.

"Whitehall, 2 March, 1969.

"Sir,—I am directed by Mr. Secretary Bruce to acknowledge the receipt of your letter of the 27th ultimo, and to inform you that a short Bill will be introduced into Parliament to remove the grievance of which you complain.

"I am, Sir, your obedient servant,

"Mr. E. Thomas, Brentford." "A. F. O. LIDDELL.

CO-OPERATIVE CUTTING.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—In certain parts of London, Co-operative Supply Associations are seriously injuring the neighbouring chemists by selling medicines and perfumery at wholesale prices. Of course it is impossible to prevent men combining for their mutual benefit, and the efforts of underpaid clerks to make small incomes go as far as possible deserve encouragement. It seems to me, however, that the co-operative supply system is extended beyond its legitimate bounds when the wealthy classes are supplied with the luxuries of the toilet and the occasional necessaries of the sick chamber at prices such as no chemist doing a legitimate business can descend to. It has become the practice with these associations to supply fancy goods and patent medicine at wholesale prices, and to send prescriptions to certain chemists allied with them who allow 25 per cent. off the usual charges. Admitting the right of professional chemists and clerks to trade together, it becomes a question whether proprietors of patent medicines and other articles hitherto sold exclusively by chemists and druggists, are acting wisely in supplying their goods to these companies, who are selling them to the prejudice of their old legitimate customers. However much we may dislike this state of things, and however much we may deprecate the short-sighted policy of manufacturers in assisting to divert trade into irregular channels for a mere temporary advantage, we seem to have no remedy for the growing evil, and consciousness of our helplessness probably accounts for the absence of any discussion on the subject in our trade organs. I now hear that my co-operative neighbours have been fitting up a dispensing department at their stores, and that the dispensing of prescriptions is to become an important part of their business. I desire to raise the question as to the legality of this proposed encroachment on the protected domain of pharmacy, and trust that it may receive the consideration of the Pharmaceutical Registrar. Can a company not registered under the Act virtually keep open shop for the sale of poisons and the dispensing of prescriptions, even though the "drug department" be under the superintendence of a pharmaceutical or registered chemist?

I forward for your edification the price lists of two or three of the principal stores, and I am quite sure that when you have looked over them you will own that I have not exaggerated the evil which has emboldened me to write this letter.

I am, Sir, yours obediently,

WALTER WADE.

Jermyn-street, March 9.

[We print one of the lists kindly forwarded by our correspondent. It is issued by the London Co-operative Commissariat. The other lists are quite as bad, but they are too long for insertion this month:—

DRUGS, FAMILY AND PATENT MEDICINES, ETC.

Acidulated Syrup .. .. per bott.	0/6
Acid, Citric .. .. per lb.	3/0
Alum, Crystals .. .. ,,	0/2
Ditto, Powder .. .. ,,	0/3
Ammonia, Liquid .. .. .. per 4-oz. bott.	0/4
Aromatic Vinegar .. .. .. per 1-oz. bott.	0/7
Benzine .. .. per 4-oz. bott.	0/6
Benzine Collas .. .. per bott. 0/6, 1/0,	1/6
Blue Pill and Draught	0/3
Borax, Lump .. .. per lb.	0/11
Ditto, Powder .. .. ,,	1/0
Camomile Flowers .. .. per oz. 0/2 ,,	2/3
Camphor .. .. ,,	2/6
Ditto Balls .. .. each	0/2
Ditto Fluid (Sir J. Murray's) .. .. per bot. 0/8 and	1/4
Camphorated Chalk .. .. .. per 2-oz. box,	0/4
Carbonate of Soda (Howard's) .. .. per bott. 0/4 &	0/6
Ditto ditto .. .. .. per lb.	0/6
Castor Oil .. .. 4-oz. 0/5, 8-oz. 0/9, 16-oz. 1/4, 28-oz.	2/4
Cement (Foulke's)	0/8
Charcoal Powder (Bragg's) .. .. per bott. 1/6 &	3/0
Ditto Biscuits (Bragg's) .. .. in tins, 0/9, 1/6, &	3/9
Chloric Ether .. .. .. per 2-oz. bott.	0/8
Chlorodyne Lozenges .. .. .. per oz.	0/3
Citrate of Iron and Quinine .. .. .. ,,	1/11
Ditto Magnesia 0/5, 0/7, 0/11,	1/10
Cod-liver Oil .. .. per ½ pint, 0/8, per pint, 1/3, per quart,	2/6
Compound Decoct. Sarsaparilla .. per 4-oz. bott. 1/6, 8-oz. 2/3, 16-oz.	4/3
Compound Rhubarb Pills .. .. .. per box, 0/4 &	0/6
Condy's Fluid .. .. per bott. 0/4½ &	0/9
Corn Plaister .. .. per box, 0/3 &	/6
Cotton Wool, Medicated .. .. per b.	2/6

Cotton Wool, Medicated	..	..	in ½-lb. packets 1/6
Cough Lozenges, Pectoral	..	..	.. per box 0 9
Ditto (Summers)	..	..	.. ,, 0/10½
Court Plaister, Epsom	..	..	.. per packet 0/4
Ditto, Tricolour	..	..	.. per packet, 0/4 & 0/8
Cream of Tartar	..	..	.. .. per lb 1/4
Diachylon Plaister	..	..	.. .. per yard 0/5
Dill Seed Water	..	..	.. .. per ½ pint 0/5
Elder Flower Water	..	..	.. .. per pint 0/7
Epsom Salts	..	..	.. per 4-oz. packet 0/1
Essence of Bergamotte	..	..	.. per ½-oz. bott. 1/0
Ditto Ginger	..	..	.. per ½-oz. bott. 0/11
Ditto Peppermint	..	..	.. per oz. bott. 0/9
Ditto Cloves	..	..	.. ,, 0/3
Extract of Taraxacum (Liquid)	..	..	.. per 4 oz. bott. 1/7
Feeding Bottles	..	..	.. .. 0/8, 1/1, 1/9
Ditto, Teats for	ditto	..	.. .. 0/1½, 0/2
Fuller's Earth	..	..	.. .. per lb. 0/2
Glycerine (Price's)	..	..	.. per 4½-oz. 0/9, 2-oz. 3/0
Gold Beater's Skin	..	..	.. .. per packet 0/2
Gum Arabic	..	..	.. .. per lb. 2/6
Infant's Food (Savory and Moore's)	..	..	.. .. 1/4, 3/6
Ditto (Dr. Ridge's)	..	..	.. .. per tin, 0/8, 1/8
Ipecacuanha Lozenges	..	..	.. .. per oz. 0/2
Ditto Wine	..	..	.. per 4-oz. bott. 0/10
Lenitive Electuary	..	..	.. .. per pot 0/6
Linseed	..	..	.. .. per lb. 0/4
Ditto Crushed	..	..	.. .. ,, 0/6
Lint	..	..	.. per oz. 0/3, per box 6/4
Lip Salve	..	..	.. .. per pot 0/3
Magnesia, Calcined	..	..	.. .. per bott. 1/8
Ditto Fluid (Dinneford's)	..	..	.. .. 0/8 1/8
Ditto ditto (Sir J. Murray's)	..	..	.. .. 0/8 1/8
Marking Ink, Bond's original	..	..	.. .. per oz 0/8
Opodeldoc	..	..	per 2 oz. and 3-oz. bott. 0/5 0/8
Orange Flower Water	..	..	per 4-oz. bott. 0/5, 16-oz. 1/6
Orris Root	..	..	.. .. per lb. 1/0
Ditto Powdered	..	..	.. .. ,, 1/2
PATENT MEDICINES—			
Balsam of Aniseed (Powell's)	..	..	.. per bott. 0/10½
Camomile Pills (Norton's)	..	..	.. 0 10½ & 2/3
Chlorodyne (Collis Browne's)	..	..	.. 0/10½ & 2/3
Cockle's Pills	..	..	.. 0/10½ & 2/3
Dissatised Organic Iron (Dr. Baud's)	..	..	.. .. 2/3
Extract of Elder Flowers (Godfrey's)	..	..	.. per bott. 2/3
Godfrey's Cordial	..	..	.. ,, 0/8
Gregory's Powders	..	..	.. ,, 1/6
Iodine for Purifying the Blood (Dr. Baud's)			.. .. 2/3
Pulmonic Wafers (Locock's)	..	..	.. .. 0/10½
Sarsaparilla (Dr. J. Townsend's)	..	..	.. 1/10 & 3/0
Stedman's Soothing Powders	..	..	.. per box 0/10½
Poppy Heads	..	..	.. per doz. 0/6
Potass, Bicarbonate of	..	..	.. per lb. 1/1
Pyretic Saline (Lamplough's)	..	..	.. per bott. 2/0
Quinine Wine	..	..	.. 16 oz. 2/0
Ditto Sulphate of	..	..	.. per 60 grains 1/0
Ditto, ditto	..	..	.. per oz. 0/5
Rhubarb, Powder	..	..	.. per 2 oz. 0/10
Roses, Milk of	..	..	.. per 4 oz. 0/9
Rose Water	..	..	per 8 oz. 0/5, 16 oz. 0/10
Sal Volatile	..	..	.. .. per 4 oz. 1/0
Salts of Lemon	..	..	.. .. per box 0/4
Seidlitz Powders	..	..	.. .. ,, 0/9
Senna Leaves	..	..	.. per 2-oz. packet 0/2
Smelling Salts, Preston	..	..	.. per bottle, 0/4 and 0/8
Spermaceti	..	..	.. .. per lb. 2/0
Ditto Ointment	..	..	.. .. per pot 0/4
Spirit of Camphor	..	..	.. per 4 oz. 1/0
Ditto Hartshorn	..	..	.. per ½ pint 0/6
Steel Wine	..	..	per 4-oz. 0/9, 8-oz. 1/6, 16 oz. 2/10
Sulphur, Milk of	..	..	.. .. per lb. 0/9
Sweet Oil of Almonds	..	..	.. per 8-oz. bott. 1/6
Ditto Spirit of Nitre	..	..	.. per 4-oz. bott. 1/0
Syrup of Senna	..	..	.. per 4-oz. bott. 0/6
Ditto of Tolute	..	..	.. per 8-oz. bott. 1/0
Tartaric Acid	..	..	.. .. per lb. 1/10
Ditto ditto Crystals	..	..	.. .. ,, 1/10
Tincture of Arnica	..	..	.. per 1-oz. bott. 0/4
Ditto of Bark	..	..	.. per 4 oz. bott. 1/0
Ditto of Gentian	..	..	.. per 4-oz. bott. 0/10
Ditto of Myrrh	..	..	.. per 4-oz. bott. 1/2
Ditto of Orange Peel	..	..	.. per 4-oz. bott. 0/10
Ditto of Quinine	..	..	.. per 4-oz. bott. 1/3
Ditto of Rhubarb	..	..	.. per 4-oz. bott. 0/10
Voice Lozenges	..	..	.. per 4-oz. bott. 0/3
White Wax	..	..	.. .. per lb. 2/8

ASSOCIATES OF THE PHARMACEUTICAL SOCIETY.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

DEAR SIR,—I wish to call the attention of those gentlemen residing in London, to whom the privileges of the Pharmaceutical Society are more particularly valuable, to Section 20 of the New Pharmacy Act; and also to the following answer, in the February number of the *Pharmaceutical Journal*, to a correspondent signing himself, "H. I.":—

"Having passed the modified examination, and been registered a chemist and druggist, a man will be eligible for admission as an associate. Read attentively Section 20 of the New Pharmacy Act."

This *reads* straightforward enough, but requires the attention of the Council as regards the practical working, as the little fact I have to mention will prove.

In January last, a gentleman who had passed his modified examination, had registered in accordance with the Act, and *had read* attentively Section 20, applied for admission, tendering the necessary fees. Admission was refused, and his application paper destroyed; the grounds for such being the advice of the solicitor to the society, who thought it was unjust towards those gentlemen who had been through the superior test of the minor examination.

I have waited for the March journal, expecting to find some contradiction of the previous month's answer to "H. I.," but have searched its pages in vain. That such an encroachment on the rights and privileges of an associate should be looked forward to with no small amount of displeasure by those who have undergone the labour and anxiety of the minor examination is, I think, not to be wondered at, for, to say the least, it is unfair; but that such a law exists appears undeniable, and the rejection of the above candidate demands explanation.

I hope the subject will be brought before the council, and definitely arranged, as the position of the minor associate seems in danger.

Trusting there is some legislation of which we are at present ignorant, but which will enable us to retain the superior rank we have earned by our merits, and thanking you for the insertion of this letter,

I remain, dear sir,

Yours respectfully,

A MINOR ASSOCIATE.

WE gather from the Board of Trade Returns, which have been recently made up for 1868, that the export trade in drugs and chemical products has been in a condition which for healthiness compares favourably with the average of business during that period of depression. The total declared value of British exports in 1868 was nearly 180 millions—a million less than the previous year, and ten millions in arrear of 1866. One would hardly have anticipated even so good a return as this, judging from the serious and constant complaints which became chronic during that period. To make up the enormous total given above physic contributes a comparatively small figure. Soda is the most important chemical manufacture exported from this country, and in this, while we note a decrease in the declared value, we find the quantity exported to have been 25,000 tons in excess of the figures of 1866. Under the head of medicines, we find the remarkable difference of more than £50,000 between the two years we are comparing, and on the wrong side. Does this indicate that Holloway's ointment is waning in popularity among the Red Indians and Chinese? Chemical products used in dyeing and other processes give us a balance of £100,000 in favour of 1868, and this we regard as a most favourable sign of business, as it represents an increase of about 20 per cent., the exact figures for this item being 1866, £477,288, and 1868, £569,860. The figures for 1867 represent not much less business than in 1868. These are welcome facts, and we hope will induce a spirit of hopefulness and emulation among manufacturers of chemicals, &c. at home.

DRUGS.

The markets for drugs have been moderately firm during the past month, with but one notable exception, which has occurred in OPIUM, and here the difference has been rather in tendency than amount. The rapid rise in value which has taken place in opium has been doubtless due partly to the efforts of certain speculators, and it is evidently not a very difficult matter for a man of capital and pluck to make a good thing now and then with such a drug as this. The following is extracted from the monthly circular of Mr. E. R. Heffter, of Smyrna, dated 27th February, 1869, and gives the position of opium at head quarters:—

"The demand has been so limited during the present month that, in spite of the smallness of stocks and the efforts

of holders to maintain their last position, prices have given way, and the market now closes weak at 362 piastres (43s. per lb. f. o. b.), at which figure 1 basket only was lately sold on speculation. As we are approaching the close of the season, the anxiety of holders to realise may become more and more apparent.

"Sales, 59 baskets, at from 390 to 362 piastres.

"Stock.—130 baskets."

Quinine still advances, and in consequence the price of the Barks yielding this alkaloid are also higher. Musk has sold at a little higher price. Balsam Capivi is 3d. dearer, and Balsam of Tolu 3d. lower. Castor Oil is a trifle cheaper, though the latest reports from Calcutta give the price of castor seeds as higher, and the oil consequently advancing. Camphor is slightly on the rise, and will probably be dearer. The finest qualities of Bergamot are a little more reasonable. Lemon is higher. Gum Arabic has advanced an average of 3s. per cwt., but Myrrh and Benjamin are easier.

OILS.

The trade in Olive Oil has been very quiet throughout the month, and prices have again slightly given way. This time last year Olive Oil was rising. Linseed Oil is very firm, and is getting dearer, and most of the Fish Oils are a little higher. Turpentine is quiet, and Petroleum easier, 1s. 9d. being now scarcely obtainable.

DYES.

Logwood is still much in demand, and prices are firm, although large quantities continue to arrive. Madder has advanced to a point which has suspended business, but it is probable that holders must be the first to give way.

CHEMICALS.

Prices are still well maintained. Brimstone and Saltpetre still continue very firm, the latter on the rise both in England and India. Citric Acid is dull, Tartaric firm; in the former case buyers, in the latter sellers, have the advantage of 1¼d. Quinine has advanced quite 6d. per ounce in the course of the month, and will no doubt retain better prices for a long time.

Mr. W. Caudery, of 6, Billiter-square, has kindly furnished us with the following detailed report on the business transacted during the period which has elapsed since our last issue:—

There was throughout the month a fair average demand for consumption, and in one or two articles there has been some little speculation. Shipping orders were but few, and the absence of them, especially from America, has tended to keep prices low.

Soda.—In London Crystals were very dull all through the month at £4 2s. 6d. ex ship, but in Newcastle they were in more demand, and manufacturers were enabled to realise a rather higher price in proportion to that ruling in London—viz., £3 17s. 6d. free on board there. Ash rather improved in price, business to a fair extent being done at 1⅞d. per cent. per cwt. ex ship to 1¹⁵⁄₁₆d. landed. Bicarbonate very quiet at 10s. 9d. landed. Caustic experienced a good enquiry at advanced prices up to 15s. per cent. for best white, 60 to 62 per cent. the closing quotation.

Bleaching Powder quiet at 10s. 9d. landed.

Acids.—Tartaric during the first half of the month was quiet but firmly held at 1s. 2¼d. for English and 1s. 2d. for foreign, but in the latter half an active demand sprang up, and a large business was transacted, and prices rapidly advanced, closing firmly at 1s. 3d. for best English. Citric drooped to 2s. 8½d., there being but a very small inquiry.

Cream of Tartar.—A good business transacted at the advanced quotation of 87s. 6d.

Sulphate of Quinine, until towards the end of the month, remained as last quoted; but the price of English being then advanced 3d. per ounce. Foreign followed, and 5s. 4d. and 5s. 9d. are now the respective quotations.

Sugar of Lead higher. Best white quoted 42s.

Sulphate of Ammonia.—For discoloured there has been an excellent inquiry, and this has realized full prices; but although a good business has likewise been done in best white, it was slightly easier, the ruling prices being £16 10s. to £16 15s.

Potash.—Chloride steady at 12d. Bichromate has fallen again to old price of 5d.

Refined Borax lower, 66s. per cwt. being accepted.

Refined Saltpetre higher, business done at 29s. 6d. to 30s.

Quicksilver fell to £6 15s., but within two or three days was again advanced to the old figure of £6 17s.

We have added to our price current the values of a few dye-woods, and will endeavour next month to add to these, as it will often be a convenient reference to druggists who deal in such goods largely, and perhaps still more so for those who only sell them occasionally.

Monthly Statement

Of the Stocks, Landings, and Deliveries of the following Goods at the Port of London, from Jan. 1 to Feb. 27, 1869 and 1868.

	Stock Feb. 27.		Landings.		Deliveries	
	1869	1868.	1869.	1868.	1869.	1868.
Aloes .... casks	2601	3032	239	569	440	707
kegs	78	111	—	—	—	1
gourds	928	1435	171	—	221	318
Aniseed, Star .....chests	390	310	—	—	76	24
Arrowroot ..... casks	12361	12793	803	1326	1530	1209
boxes and tins	17355	20241	1143	3631	2432	2408
Balsam ..... casks, &c.	256	254	163	105	433	100
Bark, Medicinal, casks and cases	345	361	142	68	29	13
serons, &c.	5357	10727	3477	4474	4607	2512
Bark, Tanners..... tons	108	143	15	300	7	231
Borax..... packages	128	83	—	2	5	10
Bees & veget. wax bales & serons	665	250	230	142	39	142
casks and cases	924	1285	344	144	213	246
cakes	1559	1235	436	1409	20	1589
Brimstone..... tons	—	—	—	—	—	—
Camphor ..... packages	2515	2972	3155	1458	3961	291
Cardamoms ..... chests	103	61	85	19	69	48
Cochineal—						
Honduras ..... serons	2083	3321	121	308	747	402
Mexican ..... ,,	156	680	108	170	230	240
Teneriffe ..... ,,	9172	8185	5360	6304	3189	3214
Coculus Indicus ..... bags, &c.	1512	952	—	—	64	41
Colombo root ..... packages	1828	2008	—	3	12	327
Cream of Tartar..... casks	20	276	23	55	21	44
Cubebs ..... bags	2010	1753	—	503	175	32
Dragonsblood ..... chests	220	130	71	77	17	44
Galls, E. I. .... casks and cases	5187	3279	1718	1962	1385	641
Mediterranean ..... sacks	29	27	14	—	—	43
Gum—						
Ammoniac ..... packages	184	200	—	27	19	14
Animi and Copal .. ,,	1394	1416	991	641	988	475
Arabic, Barbary .... ,,	13	186	58	126	105	100
Turkey ..... ,,	77	31	—	11	4	42
East India..... ,,	2907	1715	1274	1227	523	538
Assafœtida ..... ,,	86	175	47	153	32	73
Benjamin ..... ,,	1404	1099	429	453	264	230
Dammar ..... ,,	1538	1024	622	22	364	118
Galbanum..... ,,	10	—	8	—	—	6
Gamboge ..... ,,	137	90	40	41	47	24
Guaiacum ..... ,,	93	103	35	21	17	2
Kino ..... ,,	177	239	—	149	25	9
Kowrie ..... tons	906	1830	14	437	263	295
Mastic ..... packages	183	232	—	—	—	1
Myrrh, E. I. ..... ,,	73	101	90	115	60	48
Olibanum ..... ,,	1676	1564	212	795	271	431
Tragacanth ..... ,,	527	201	451	199	184	137
Senegal ..... tons	85	73	16	11	9	8
Tragacanth ..... packages	22	27	—	7	—	18
Ipecacuanha .... casks and bags	60	108	29	65	43	80
Jalap ..... bales	230	289	54	81	61	46
Lac-Dye.....chests	3070	3482	575	1019	1007	1192
Nux Vomica..... packages	4245	288	748	175	1957	235
Oil—						
Castor ..... casks	102	89	—	6	6	—
cases	905	596	200	600	647	431
dppers and tins	12140	16293	5249	15772	4174	4107
Palm ..... tuns	2006	851	1182	1204	707	1008
Cocoanut ..... ,,	4091	3304	1912	1455	1280	1381
Olive ..... casks, &c.	1050	983	1440	360	1104	1097
Anised..... cases	285	75	257	48	130	69
Cassia ..... ,,	741	396	149	69	161	44
Opium .....chests, &c.	229	349	—	—	no	retrn
Rhubarb .....chests..	1911	672	544	387	422	234
Safflower—						
Bengal ..... bales	1664	2095	703	1281	842	871
Bombay..... ,,	125	67	3	—	60	29
Saffron ..... packages	12	10	7	1	5	1
Sarsaparilla ..... bales	249	400	365	321	497	257
Senna..... bales, &c.	2261	2536	262	764	367	470
Shellac ..... chests, &c.	9320	11794	1821	2564	2089	2872
Sticklac..... ,,	5239	2586	2075	112	465	330
Terra Japonica—						
Gambier ..... tons	4433	3151	2405	2755	1216	1086
Cutch..... ,,	1559	374	551	241	624	292
Turmeric ..... ,,	984	892	480	243	379	155
Vermillion..... chests, &c.	132	70	50	—	32	11

Monthly Price Current.

[The prices quoted in the following list are those actually obtained in Mincing lane for articles sold in bulk. Our Retail Subscribers must not expect to purchase at these market prices, but they may draw from them useful conclusions respecting the prices at which articles are offered by the Wholesale Firms.]

CHEMICALS.	1869. Jan. s. d.	to s. d.	1868. Jan. s. d.	to s. d.
ACIDS—				
Acetic .....per lb.	0 4 ..	0 0	0 4 ..	0 0
Arsenious (*see* Arsenic)				
Citric .....per lb.	2 8½ ..	0 0	1 10 ..	0 0
Nitric ..... ,,	0 5 ..	0 5½	0 5 ..	0 5½
Oxalic ..... ,,	0 8 ..	0 8	0 8½ ..	0 0
Sulphuric ..... ,,	0 0½ ..	0 1	0 0½ ..	0 1
Tartaric crystal .. ,,	1 3 ..	0 0	1 1½ ..	0 0
powdered ,,	1 3½ ..	0 0	1 2 ..	0 0
ANTIMONY ore.....per ton	280 0 ..	300 0	300 0 ..	320 0
crude ..per cwt	25 0 ..	26 0	23 0 ..	0 0
regulus.. ,,	48 0 ..	49 0	43 0 ..	0 0
star ..... ,,	48 0 ..	0 0	45 0 ..	0 0
ARSENIC, lump..... ,,	16 0 ..	16 6	16 0 ..	16 6
powder.... ,,	7 6 ..	8 0	7 3 ..	7 6
BRIMSTONE, rough ..per ton	165 0 ..	0 0	132 6 ..	135 0
roll ....per cwt	12 0 ..	0 0	10 3 ..	11 0
flour..... ,,	14 0 ..	14 6	14 0 ..	14 6
IODINE, dry .....per oz.	0 9½ ..	0 10	0 9½ ..	0 9½
IVORY BLACK, dry..per cwt.	0 0 ..	0 0	0 0 ..	0 0
MAGNESIA, calcined..per lb.	1 6 ..	1 8	1 6 ..	1 8
MERCURY..... per bottle	137 6 ..	0 0	137 6 ..	0 0
MINIUM, red .....per cwt.	20 9 ..	21 0	21 6 ..	22 0
orange .... ,,	31 9 ..	32 6	33 6 ..	0 0
PRECIPITATE, red ....per lb.	2 6 ..	0 0	2 6 ..	0 0
white .. ,,	2 5 ..	0 0	2 5 ..	0 0
PRUSSIAN BLUE ..... ,,	1 0 ..	1 10	1 0 ..	1 10
SALTS—				
Alum .....per ton	150 0 ..	155 0	150 0 ..	155 0
powder .... ,,	170 0 ..	175 0	170 0 ..	175 0
Ammonia:				
Carbonate .....per lb.	0 5⅜ ..	0 6	0 5 ..	0 5½
Hydrochlorate, crude, white..... per ton	540 0 ..	0 0	420 0 ..	500 0
British (*see* Sal Ammoniac)				
Muriate (*see* Hydrochlorate)				
Sulphate .....per ton	330 0 ..	340 0	280 0 ..	290 0
Argol, Cape .....per cwt	76 0 ..	82 6	65 0 ..	75 0
France .... ,,	45 0 ..	60 0	48 0 ..	70 0
Oporto, red ,,	25 0 ..	27 0	26 0 ..	28 0
Sicily .... ,,	45 0 ..	50 0	50 0 ..	55 0
Naples, white ,,	55 0 ..	65 0	60 0 ..	70 0
Florence, white ,,	70 0 ..	75 0	75 0 ..	80 0
,, red ,,	60 0 ..	65 0	65 0 ..	70 0
Bologna, white ,,	0 0 ..	0 0	78 0 ..	80 0
Ashes (*see* Potash and Soda)				
Bleaching powd..per cwt.	10 9 ..	11 0	12 0 ..	12 6
Borax, crude .... ,,	25 0 ..	40 0	25 0 ..	35 0
(Tincal) .. ,,	40 0 ..	58 0	25 0 ..	55 0
British refnd. ,,	65 0 ..	66 0	50 0 ..	52 6
Calomel .....per lb.	2 5 ..	0 0	2 5 ..	0 0
Copper:				
Sulphate .....per cwt.	25 0 ..	26 0	24 6 ..	25 0
Copperas, green ..per ton	52 6 ..	60 0	55 0 ..	57 0
CorrosiveSublimate..p.lb.	1 11 ..	0 0	1 11 ..	0 0
Cr. Tartar, French, p. cwt.	87 6 ..	0 0	78 0 ..	80 0
Venetian grey ,,	70 0 ..	0 0	0 0 ..	0 0
brown ,,	62 6 ..	65 0	54 0 ..	60 0
Epsom Salts ....per cwt.	8 0 ..	8 6	8 0 ..	9 0
Glauber Salts .... ,,	5 6 ..	6 0	5 6 ..	6 0
Lime:				
Acetate, white, per cwt.	12 6 ..	21 6	13 0 ..	22 0
Magnesia:				
Carbonate..... ,,	42 6 ..	0 0	42 6 ..	0 0
Potash:				
Bichromate ....per lb.	0 5 ..	0 0	0 5 ..	0 5½
Carbonate:				
Potashes, Canada, 1st sort .....per cwt.	32 0 ..	0 0	33 0 ..	0 0
Pearlashes, Canada, 1st sort .....per cwt.	32 0 ..	0 0	34 0 ..	35 0
Chlorate .....per lb.	1 0 ..	0 0	1 0 ..	0 0
Hydriodate (*see* Potassium, Iodide)				
Muriate (*see* Potassium, Chloride)				
Prussiate .....per lb.	0 11½ ..	1 0	1 0 ..	1 1
red .... ,,	1 0½ ..	1 10	1 0½ ..	1 10
Tartrate (*see* Argol and Cream of Tartar)				
Potassium:				
Chloride .....per cwt.	8 0 ..	8 6	8 0 ..	8 6
Iodide..... per lb.	12 0 ..	0 0	11 9 ..	0 0
Quinine:				
Sulphate, British, in bottles ..... per oz.	5 9 ..	0 0	4 3 ..	4 6
Sulphate, French ,,	5 4 ..	0 0	4 0 ..	4 1
Sal Acetos .....per lb.	0 10½ ..	0 0	0 10½ ..	0 0
Sal Ammoniac, Brit. cwt.	36 0 ..	38 0	35 0 ..	34 6
Saltpetre:				
Bengal, 6 per cent. or under ..... per cwt.	25 9 ..	26 3	19 0 ..	19 6
Bengal, over 6 per cent. per cwt.	24 9 ..	25 6	18 3 ..	19 0
Madras..... ,,	0 0 ..	0 0	18 0 ..	18 6
Bomb & Kurrachee p.ct.	0 0 to	0 0	18 0 to	18 0
European..... ,,	0 0 ..	0 0	21 6 ..	22 6
British, refined ,,	29 6 ..	30 0	22 9 ..	23 6
Soda: Bicarbonate, p.cwt.	10 9 ..	0 0	13 0 ..	0 0
Carbonate:				
Soda Ash....per deg.	0 1½ ..	0 0	0 2 ..	0 0
Soda Crystals per ton.	82 6 ..	0 0	95 0 ..	0 0
Hyposulphite..per cwt.	18 0 ..	22 0	23 0 ..	0 0
Nitrate ..... ,,	16 9 ..	17 0	11 0 ..	12 6
SUGAR OF LEAD, White, cwt.	40 0 ..	42 0	37 6 ..	38 0
Brown ..... ,,	29 0 ..	30 0	28 0 ..	29 0
SULPHUR (*see* Brimstone				
VERDIGRIS ..... per lb.	0 11 ..	1 1	0 11 ..	1 0
VERMILION, English..per lb.	2 6 ..	3 0	2 9 ..	3 1
China..... ,,	2 9 ..	3 0	2 9 ..	3 0
DRUGS.				
ALOES, Hepatic....per cwt.	90 0 ..	190 0	100 0 ..	195 0
Socotrine .. ,,	140 0 ..	280 0	180 0 ..	300 0
Cape, good.. ,,	29 0 ..	32 0	30 0 ..	32 0
Inferior ,,	16 0 ..	28 0	18 0 ..	29 0
Barbadoes ,,	70 0 ..	190 0	75 0 ..	220 0
AMBERGRIS, grey ....per oz.	27 6 ..	32 6	32 0 ..	35 0
BALSAMS—				
Canada ..... per lb.	1 3 ..	0 0	1 5 ..	1 6
Capivi ..... ,,	2 0 ..	0 0	1 8 ..	1 9
Peru ..... ,,	11 0 ..	12 0	8 0 ..	0 0
Tolu ..... ,,	2 3 ..	0 0	2 7 ..	0 0
BARKS—				
Canella alba ....per cwt.	30 0 ..	45 0	22 0 ..	27 0
Cascarilla..... ,,	23 0 ..	35 0	25 0 ..	35 0
Peru, crown & grey per lb.	0 10 ..	1 10	1 0 ..	2 0
Calisaya, flat ,,	2 10 ..	3 6	2 6 ..	2 9
quill ,,	2 8 ..	3 3	2 5 ..	2 6
Carthagena ,,	0 10 ..	1 6	0 9 ..	1 3
Pitayo ..... ,,	0 8 ..	1 4	0 9 ..	1 6
Red ..... ,,	3 0 ..	9 0	2 6 ..	10 0
Bucho Leaves ..... ,,	0 3 ..	0 8	0 2½ ..	0 9
CAMPHOR, China.. per cwt.	117 0 ..	0 0	140 0 ..	0 0
Japan ,,	120 0 ..	0 0	142 6 ..	0 0
Refin Eng. per lb.	1 8 ..	0 0	1 10 ..	11 0
CANTHARIDES ..... ,,	2 2 ..	0 0	2 0 ..	0 0
CHAMOMILE FLOWERS p. cwt	60 0 ..	100 0	45 0 ..	80 0
CASTOREUM ..... per lb.	5 0 ..	52 0	5 0 ..	32 0
DRAGON'S BLOOD, reed p. ct.	100 0 ..	220 0	100 0 ..	220 0
lump ,,	100 0 ..	200 0	100 0 ..	240 0
FRUITS AND SEEDS (*see also* Seeds *and* Spices)				
Anise, China Star pr cwt.	97 6 ..	100 0	115 0 ..	120 0
German, &c. ,,	30 0 ..	40 0	28 0 ..	40 0
Beans, Tonquin .. per lb.	1 2 ..	1 6	1 0 ..	1 9
Cardamoms, Malabar				
good ,,	7 9 ..	8 3	7 9 ..	9 0
inferior ,,	6 6 ..	7 3	5 3 ..	7 6
Madras ,,	4 6 ..	8 6	4 6 ..	7 0
Ceylon ,,	2 9 ..	3 3	2 10 ..	3 0
Corozo Nuts.... per cwt.	14 0 ..	18 0	10 0 ..	18 0
Cassia Fistula.. ,,	15 0 ..	28 0	20 0 ..	32 0
Castor Seeds .. ,,	11 0 ..	13 0	10 0 ..	12 0
Cocculus Indicus ,,	24 0 ..	26 0	22 6 ..	25 0
Colocynth, apple.. per lb.	0 5 ..	0 10	0 0 ..	0 11
Croton Seeds .. per cwt.	70 0 ..	75 0	97 6 ..	115 0
Cubebs ..... ,,	42 0 ..	0 0	45 0 ..	47 0
Cummin..... ,,	40 0 ..	50 0	16 0 ..	20 0
Dividivi ..... ,,	10 6 ..	12 6	11 0 ..	13 0
Fenugreek..... ,,	9 0 ..	14 0	11 0 ..	12 0
Guinea Grains .. ,,	38 0 ..	40 0	45 0 ..	48 0
Juniper Berries ,,	7 0 ..	8 0	9 0 ..	10 0
Myrobalans .... ,,	11 0 ..	17 0	12 0 ..	16 6
Nux Vomica.... ,,	11 6 ..	14 0	12 0 ..	13 0
Tamarinds, East India ,,	26 0 ..	30 0	22 0 ..	29 6
West India, new ,,	16 0 ..	30 0	16 0 ..	27 0
Vanilla, large .. per lb.	10 0 ..	16 0	9 0 ..	14 0
inferior ,,	1 5 0 ..	9 0	4 0 ..	8 0
Wormseed per cwt.	25 0 ..	30 0	1 6 ..	0 0
GINGER, Preserved, in bond (duty 1d. per lb.) per lb.	0 6 ..	0 10	0 9 ..	0 10
GUMS (*see separate list*)				
HONEY, Narbonne ,,	0 0 ..	0 0	0 0 ..	0 0
Cuba ..... ,,	21 0 ..	36 0	25 0 ..	38 0
Jamaica.. ,,	25 0 ..	45 0	22 0 ..	42 0
IPECACUANHA ..... ,,	6 0 ..	6 3	7 3 ..	7 6
ISINGLASS, Brazil.. ,,	3 1 ..	3 4	2 4 ..	4 0
Tongue sort ,,	3 6 ..	5 0	2 10 ..	5 0
East India ,,	2 8 ..	4 1	2 0 ..	4 0
West India ,,	3 8 ..	4 0	3 7 ..	4 0
Russ. long staple ,,	8 0 ..	9 0	9 0 ..	10 0
,, leaf ,,	5 6 ..	7 0	6 0 ..	9 0
,, Simovia ,,	1 6 ..	2 6	1 6 ..	2 6
JALAP, good ..... ,,	3 9 ..	4 3	3 8 ..	5 0
Infer. & stems ,,	0 6 ..	3 6	0 9 ..	3 10
LEMON JUICE ....per degree	0 1 ..	0 1½	0 0½ ..	0 0
LIQUORICE, Spanish per cwt.	63 0 ..	68 0	65 0 ..	70 0
Italian ,,	48 0 ..	68 0	50 0 ..	60 0
MANNA, flaky .... ,,	3 0 ..	3 6	3 9 ..	4 3
small..... per lb.	1 3 ..	1 9	1 10 ..	0 0
MUSK..... per oz.	24 0 ..	36 0	21 0 ..	38 0
OILS (*see also separate List*)				
Almond, expressed per lb.	1 3 ..	0 0	1 [illegible] ..	0 0
CASTOR, 1st pale .... ,,	0 5⅜ ..	0 6	1 7 ..	0 8
second .... ,,	0 5¼ ..	0 5½	0 6½ ..	0 6¾
Infer. & dark ,,	0 4¾ ..	0 5	0 6½ ..	0 6
Bombay (in casks)	0 4½ ..	0 0	0 5¼ ..	0 5½
Cod Liver .....per gall.	4 0 ..	6 3	4 6 ..	5 6
Croton..... per oz.	0 3 ..	0 4	1 2 ..	1 6
Essential Oils:				
Almond .....per lb.	40 0 ..	0 0	40 0 ..	0 0
Anise-seed ..... ,,	9 3 to	9 6	10 6 to	0 0
Bay .....per cwt.	76 0 ..	80 0	80 0 ..	90 0
Bergamot .....per lb.	12 0 ..	20 0	11 0 ..	16 0
Cajeput, (in bond) per oz.	0 1½ ..	0 2	0 2 ..	0 2½

Essential Oils, *continued:*—	1869. s.	d.		1868. s.	d.
Caraway .....per lb.	5	3	.. 6	0	5 0 .. 6 6
Cassia ..... ,,	5	6	.. 6	0	6 6 .. 6 8
Cinnamon .....per oz.	1	0	.. 4	0	1 3 .. 3 6
Cinnamon-leaf .. ,,	0	6	.. 0	0	0 5 .. 0 7
Citronelle ..... ,,	0	2½	.. 0	0	0 2½ .. 0 3
fine..... ,,	0	3½	.. 0	0	0 4 .. 0 0
Clove.....per lb.	2	9	.. 0	0	2 6 .. 0 0
Juniper ..... ,,	1	9	.. 2	0	1 9 .. 2 0
Lavender..... ,,	2	9	.. 3	9	2 9 .. 3 9
Lemon..... ,,	4	6	.. 8	0	4 6 .. 8 0
Lemongrass ....per oz.	0	4½	.. 0	5	0 6 .. 0 7
Neroli ..... ,,	0	0	.. 0	0	3 6 .. 4 6
Nutmeg ..... ,,	0	4	.. 0	7	0 3 .. 0 9
Orange.....per lb.	5	0	.. 8	0	5 0 .. 7 0
Otto of Roses....per oz.	15	0	.. 20	0	16 0 .. 20 9
Peppermint:					
American ....per lb.	19	0	.. 20	0	21 6 .. 21 6
English ..... ,,	38	0	.. 43	0	35 0 .. 43 0
Rosemary ..... ,,	1	9	.. 2	0	1 9 .. 2 0
Sassafras ..... ,,	3	6	.. 4	0	3 0 .. 3 3
Spearmint ..... ,,	14	6	.. 18	0	16 0 .. 25 0
Thyme..... ,,	1	10	.. 4	0	2 0 .. 4 0
Mace, expressed .. per oz.	0	0¾	.. 0	2½	0 2½ .. 0 2½
Opium, Turkey ..... ,,	42	0	.. 46	0	19 0 .. 20 0
inferior ..... ,,	30	0	.. 40	0	3 6 .. 7 0
Quassia(bitter wood) per ton	120	0	.. 130	0	100 0 .. 105 0
Rhubarb, China, good and fine .....per lb.	5	0	.. 8	0	7 0 .. 10 0
Good, mid. to ord. ,,	1	0	.. 4	6	1 9 .. 6 0
Dutch trimmed ,,	0	0	.. 0	0	10 0 .. 12 0
Russian ..... ,,	0	0	.. 0	0	9 0 .. 10 0
Roots—					
Calumba .....per cwt.	35	0	.. 50	0	17 0 .. 30 0
China ..... ,,	25	0	.. 35	0	30 0 .. 0 0
Galangal ..... ,,	13	0	.. 18	0	16 0 .. 17 0
Gentian ..... ,,	16	0	.. 0	0	16 0 .. 17 0
Hellebore ..... ,,	22	0	.. 30	0	6 0 .. 0 0
Orris..... ,,	28	0	.. 42	0	36 0 .. 40 0
Pellitory ..... ,,	58	0	.. 60	0	58 0 .. 60 0
Pink.....per lb.	0	6	.. 0	9	0 9 .. 0 11
Rhatany ..... ,,	0	6	.. 0	10	0 6 .. 0 10
Senega..... ,,	1	11	.. 0	0	1 6 .. 0 0
Snake ..... ,,	1	3	.. 0	0	1 0 .. 0 0
Saffron, Spanish .. ,,	28	0	.. 36	0	30 0 .. 34 0
Salep .....per cwt.	120	0	.. 130	0	100 0 .. 120 0
Sarsaparilla, Lima per lb.	0	7	.. 0	8	0 0 .. 0 0
Para ..... ,,	1	0	.. 1	3	0 0 .. 0 0
Honduras ..... ,,	1	0	.. 1	6	0 10 .. 1 4
Jamaica ..... ,,	2	1	.. 2	1	1 0 .. 2 1
Sassafras ..... per cwt.	15	0	.. 0	0	10 0 .. 0 0
Scammony, Virgin ..per lb.	28	0	.. 35	0	28 0 .. 36 0
second & ordinary ,,	10	0	.. 23	0	11 0 .. 22 0
Senna, Bombay .... ,,	0	3	.. 0	5½	0 2 .. 0 3½
Tinnivelly ..... ,,	0	2	.. 1	0	0 2 .. 0 10
Alexandria..... ,,	0	7	.. 1	0	0 5 .. 0 10
Spermaceti,refined.. ,,	1	5	.. 0	0	1 6 .. 0 0
American ..... ,,	1	4	.. 0	0	1 5 .. 0 0
Squill..... ,,	0	1	.. 0	2½	0 1 .. 0 2½
GUMS.					
Ammoniac, drop ..per cwt.	220	0	.. 260	0	180 0 .. 220 0
lump .. ,,	140	0	.. 240	0	120 0 .. 160 0
Animi, fine washed ,,	260	0	.. 320	0	210 0 .. 230 0
boldscraped ,,	190	0	.. 260	0	150 0 .. 210 0
sorts ..... ,,	110	0	.. 170	0	100 0 .. 130 0
dark ..... ,,	4	0	.. 10	0	70 0 .. 100 0
Arabic, E. I., fine pale picked .. ,,	77	0	.. 83	0	83 0 .. 85 0
srts, gd. to fin ,,	62	0	.. 74	0	72 0 .. 82 0
garblings.. ,,	40	0	.. 55	0	55 0 .. 70 0
Turkey, pick. gd to fin. ,,	180	0	.. 220	0	170 0 .. 210 0
second & inf. ,,	90	0	.. 170	0	85 0 .. 170 0
in sorts .. ,,	75	0	.. 110	0	65 0 .. 80 0
Gedda.... ,,	46	0	.. 54	0	38 0 .. 40 0
Barbary, white .. ,,	80	0	.. 100	0	70 0 .. 80 0
brown .. ,,	72	0	.. 78	0	68 0 .. 72 0
Australian ..... ,,	36	0	.. 42	0	35 0 .. 48 0
Assafœtida,com.to gd ,,	80	0	.. 110	0	55 0 .. 60 0
Benjamin, 1st qual. ,,	360	0	.. 600	0	380 0 .. 660 0
2nd ,,	150	0	.. 230	0	140 0 .. 160 0
3rd ,,	60	0	.. 130	0	70 0 .. 120 0
Copal, Angola, red ,,	90	0	.. 100	0	60 0 .. 70 0
Benguela .. ,,	85	0	.. 95	0	64 6 .. 75 0
Sierra Leone..per lb.	0	6	.. 1	1	0 6 .. 1 2
Manilla ....per cwt.	30	0	.. 45	0	26 0 .. 45 0
Dammar, pale .... ,,	87	0	.. 92	6	65 0 .. 75 0
Euphorbium ..... ,,	18	0	.. 20	0	18 0 .. 21 0
Galbanum ..... ,,	180	0	.. 220	0	240 0 .. 280 0
Gamboge,pckd pipe ,,	320	0	.. 380	0	500 0 .. 780 0
in sorts.. ,,	0	0	.. 0	0	0 0 .. 0 0
Guaiacum .....per lb.	0	8	.. 1	4	0 6 .. 2 0
Kino.....per cwt.	60	0	.. 120	0	100 0 .. 150 0
Kowrie,rough.... ,,	40	0	.. 47	0	35 0 .. 40 0
scraped .. ,,	50	0	.. 100	0	42 6 .. 75 0
Mastic, picked.....per lb.	5	0	.. 6	0	5 0 .. 6 0
Myrrh, gd. & fine per cwt.	190	0	.. 240	0	160 0 .. 200 0
sorts.....	100	0	.. 180	0	100 0 .. 170 0
Olibanum, p. sorts	73	0	.. 79	0	80 0 .. 85 0
amber & ylw.	62	0	.. 70	0	70 0 .. 80 0
garblings .... ,,	25	0	.. 45	0	27 0 .. 45 0
Senegal .....per cwt.	78	0	.. 84	0	80 0 .. 90 0
Sandarac ..... ,,	82	0	.. 105	0	85 0 .. 100 0
Thus..... ,,	13	0	to 14	0	12 0 to 0 0
Tragacanth, leaf.. ,,	230	0	.. 360	0	240 0 .. 280 0
in sorts .. ,,	120	0	.. 230	0	160 0 .. 220 0

OILS.	1869. £	s.		1868. £	s.
Seal, pale.....per tun	36	0	.. 0	0	40 0 .. 40 10
yellow to tinged ,,	33	0	.. 35	0	35 0 .. 38
brown..... ,,	31	0	.. 32	0	33 0 .. 34 0
Sperm, body ..... ,,	98	0	.. 100	0	104 0 .. 0 0
headmatter ,,	0	0	.. 0	0	0 0 .. 0 0
Cod..... ,,	40	10	.. 41	0	36 0 .. 0 0
Whale, South Sea, pale ,,	38	0	.. 0	0	38 0 .. 0 0
yellow ,,	37	0	.. 0	0	36 0 .. 37 0
brown ,,	33	0	.. 0	0	35 0 .. 0 0
East India, Fish ,,	32	0	.. 0	0	35 0 .. 0 0
Olive, Galipoli ..... ,,	54	0	.. 0	0	73 0 .. 74 0
Trieste ..... ,,	53	0	.. 0	0	72 0 .. 73 0
Levant ..... ,,	48	0	.. 0	0	69 0 .. 70 0
Mogador ..... ,,	47	0	.. 0	0	67 0 .. 0 0
Spanish ..... ,,	50	0	.. 0	0	0 0 .. 0 0
Sicily ..... ,,	50	0	.. 0	0	70 0 .. 0 0
Cocoanut, Cochin.. per ton	48	0	.. 0	0	54 0 .. 0 0
Ceylon.. ,,	46	0	.. 0	0	50 0 .. 0 0
Sydney ,,	40	0	.. 45	0	42 0 .. 50 0
Ground Nut and Gingelly :					
Bombay	0	0	.. 0	0	50 0 .. 0 0
Madras.....	35	0	.. 36	0	50 0 .. 55 0
Palm, fine	41	0	.. 42	0	39 10 .. 40 0
Linseed	30	0	.. 0	0	34 10 .. 0 0
Rapeseed, English, pale	50	0	.. 0	0	39 0 .. 0 0
brown.....	34	0	.. 0	0	36 10 .. 0 0
Foreign pale....	36	0	.. 0	0	39 10 .. 40 0
brown.....	33	10	.. 0	0	37 0 .. 0 0
Cottonseed	27	0	.. 32	0	34 0 .. 42 0
Lard.....	76	0	.. 78	0	72 0 .. 0 0
Tallow	37	0	.. 38	0	36 0 .. 38 0
Turpentine, American, cks.	33	0	.. 0	0	35 0 .. 11 0
Petrolkum, Crude	14	0	.. 15	0	10 0 .. 29 6
	s.	d.		s.	d.
refined, per gall.	1	9	.. 0	0	1 2½ .. 0 0
Spirit ,,	0	8½	.. 0	9	1 9 .. 0 0
SEEDS.	s.	d.		s.	d.
Canary .....per qr.	60	0	.. 65	0	50 0 .. 70 0
Caraway, English per cwt.	0	0	.. 0	0	44 0 .. 46 0
German, &c....	32	0	.. 44	0	40 0 .. 48 0
Coriander	19	0	.. 21	0	15 0 .. 17 0
Hemp .....per qr.	42	0	.. 44	0	42 0 .. 44 0
Linseed, English per qr..	65	0	.. 72	0	0 0 .. 0 0
Black Sea & Azof	58	0	.. 0	0	65 0 .. 0 0
Calcutta ,,	58	6	.. 0	0	64 6 .. 0 0
Bombay ,,	59	6	.. 0	0	64 6 .. 0 0
St. Petrsbrg. ,,	57	0	.. 57	6	0 0 .. 0 0
Mustard, brown..per bshl.	14	0	.. 17	0	15 0 .. 16 0
white.... ,,	13	0	.. 18	0	10 0 .. 12 0
Poppy, East India per qr,	62	0	.. 0	0	55 0 .. 0 0
SPICES.					
Cassia Lignea ....per cwt.	130	0	.. 140	0	112 0 .. 120 0
Vera ..... ,,	50	0	.. 84	0	30 0 .. 70 0
Buds ..... ,,	140	0	.. 160	0	170 0 .. 190 0
Cinnamon, Ceylon,					
1st quality ....per lb.	2	0	.. 3	10	1 11 .. 2 6
2nd do. ..... ,,	1	9	.. 3	0	1 6 .. 2 3
3rd do. ..... ,,	1	8	.. 3	0	1 4 .. 2 2
Tellicherry ..... ,,	0	0	.. 0	0	0 0 .. 0 0
Cloves, Penang..... ,,	0	10	.. 0	11½	0 10 .. 1 0
Amboyna..... ,,	0	5	.. 0	6	0 4½ .. 0 5
Zanzibar ..... ,,	0	4	.. 0	4½	0 3½ .. 0 3½
Ginger, African ..per cwt.	90	0	.. 200	0	100 0 .. 150 0
Ord. to good .. ,,	35	0	.. 80	0	40 0 .. 95 0
African..... ,,	27	6	.. 29	0	29 0 .. 0 0
Bengal ..... ,,	30	0	.. 31	0	34 0 .. 35 0
Malabar ..... ,,	0	0	.. 0	0	33 0 .. 0 0
Cochin ..... ,,	31	0	.. 120	0	44 0 .. 110 0
Pepper, Blk. Malabar, per lb.	0	5	.. 0	5½	0 4½ .. 0 5
White, Tellicherry ,,	0	10	.. 1	6	0 9 .. 1 9
Cayenne ..... ,,	0	4	.. 0	8½	0 6 .. 0 8
VARIOUS PRODUCTS.					
COCHINEAL—					
Honduras,black ..per lb.	3	2	.. 4	5	3 3 .. 4 4
,, silver .. ,,	2	10	.. 3	7	3 2 .. 3 9
,, pasty .. ,,	1	6	.. 2	8	1 6 .. 3 0
Mexican, black .... ,,	3	2	.. 3	3	3 2 .. 3 5
,, silver .. ,,	2	10	.. 0	0	3 0 .. 0 0
Teneriffe, black.... ,,	3	1	.. 5	4	3 0 .. 4 1
,, silver.... ,,	2	10	.. 3	4	3 0 .. 3 6
PUMICE STONE ..per ton	120	0	.. 160	0	120 0 .. 160 0
SOAP, Castile ....per cwt.	38	0	.. 39	0	38 0 .. 40 0
SPONGE, Turk. fine pkd pr lb.	12	0	.. 15	0	12 0 .. 14 0
Fair to good .. ,,	5	0	.. 11	0	5 0 .. 0 0
Ordinary..... ,,	2	0	.. 4	0	2 0 .. 0 0
Bahama..... ,,	0	6	.. 2	3	0 8 .. 1 9
TERRA JAPONICA—					
Gambier .. per cwt.	17	6	.. 17	9	16 6 .. 17 0
Free cubes ,,	21	0	.. 24	0	25 0 .. 27 0
Cutch ..... ,,	30	0	.. 32	0	52 6 .. 55 6
WOOD, Dye, Bar ..per ton	£5	0	.. 5	10	4 10 .. 5 0
Brazil ..... ,,	0	0	.. 0	0	85 0 .. 85 0
Brazletto ..... ,,	0	0	.. 0	0	0 0 .. 0 0
Cam..... ,,	23	0	.. 26	0	24 0 .. 28 6
Fustic, Cuba..... ,,	7	15	.. 8	15	7 10 .. 8 5
Jamaica ..... ,,	5	15	.. 7	5	6 10 .. 7 0
Savanilla..... ,,	6	0	.. 6	5	6 0 .. 6 5
Logwood, Campeachy ,,	9	10	.. 9	15	9 0 .. 10 0
Honduras ..... ,,	0	0	.. 0	0	4 5 .. 4 10
St. Domingo .... ,,	5/12	6	.. 6	0	4 10 .. 0 0
Jamaica ..... ,,	5/17	6	.. 6	0	4 10 .. 4 15
Lima, first pile.... ,,	14	0	.. 14	10	24 0 .. 25 0
Red Sanders..... ,,	6/17	6	.. 7	0	6/12 6 .. 6 15
Sapan, Bimas, &c. ,,	9	0	.. 11	0	11 10 .. 16 0